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FIRST ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF MAINE,

For the Fiscal Year Ending December 31, 1885.

Compliments of

STATE BOARD OF HEALTH

OF MAINE.

MEMBERS.—FREDERICK H. GERRISH, M. D., President, Portland.
HON. LEWIS BARKER, Bangor.
HON. STEPHEN J. YOUNG, Brunswick.
O. A. HORR, M. D., Lewiston.
E. C. JORDAN, C. E., Portland.
J. O. WEBSTER, M. D., Augusta.
A. G. YOUNG, M. D., Secretary, Augusta.

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LANE

AUGUSTA:
SPRAGUE & SON, PRINTERS TO THE STATE.
1886.

MAINE STATE BOARD OF HEALTH.

OFFICE OF THE SECRETARY,
AUGUSTA, MAINE, Feb. 24, 1886.

To His Excellency, Frederick Robie, Governor, and the Honorable Executive Council:

GENTLEMEN:—I have the honor of submitting to you the First Annual Report of the State Board of Health of Maine.

Very respectfully,

A. G. YOUNG, M. D.,
Secretary.

MEMBERS OF THE BOARD.

FREDERIC H. GERRISH, M. D., *President*,	Portland.
HON. LEWIS BARKER, . . .	Bangor.
HON. STEPHEN J. YOUNG, . .	Brunswick.
O. A. HORR, M. D., ...	Lewiston.
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ACT ESTABLISHING THE BOARD.

CHAPTER 286.

An Act to establish a State Board of Health.

Be it enacted by the Senate and House of Representatives assembled, as follows:

SECTION 1. A State Board of Health is hereby established, consisting of seven members, as follows: six members who shall be appointed by the Governor, with the advice and consent of the Council, and a secretary, as hereinafter provided. The terms of office of the six first appointed by the Governor shall be so arranged that the term of one shall expire on the thirty-first day of January of each year for six years, and each vacancy so created shall be filled for a term of six years. If any vacancy among these members shall occur otherwise, a new member shall be appointed for the unexpired term by the Governor, with the advice and consent of the Council.

At their first meeting, or as soon as a competent and suitable person can be obtained, the members appointed by the Governor shall elect a secretary, who shall, by virtue of such election, become a member of the Board, and its executive officer. The Board may elect one of their own number secretary, in which case his term of office as a member by appointment of the Governor shall expire, and the Governor, with the advice and consent of the Council, shall appoint another member to complete the full number of the Board.

SECTION 2. The State Board of Health shall have the general supervision of the interests of health and life of the citizens of the State. They shall study the vital statistics of the State, and endeavor to make intelligent and profitable use of the collected records of deaths and of sickness among the people; they shall make sanitary investigations and inquiries respecting the causes of disease, and especially of communicable diseases and epidemics, the causes of mortality, and the effects of localities, employments, conditions, ingesta, habits, and circumstances on the health of the people; they shall investigate the causes of disease occurring among the stock and domestic animals in the State, and the methods of remedying the same; they shall gather such information in respect to all these matters as they may deem proper for diffusion among the people; they shall, when required or when they shall deem it best, advise officers of the government, or other boards within the State, in regard to the location, drainage, water supply, disposal of excreta, heating and ventilation of any public institution or building; they shall from time to time examine and report upon works on the subject of hygiene for the use of the schools of the State; they shall have general oversight and direction of the enforcement of the statutes respecting the preservation of health; and they shall, in the month of January, make report to the Legislature of their doings, investigations, and discoveries during the year ending on the thirty-first day of December, with such suggestions as to legislative action as they may deem necessary.

SECTION 3. The Board shall meet quarterly at the State capital, and at such other places and times as they may deem expedient. A majority shall be a quorum for the transaction of business. They shall choose annually one of their number to be their president, and may adopt rules and by-laws subject to the provisions of this act. They shall have authority to send the secretary, or a committee of the Board, to any part of the State, when deemed necessary to conduct an investigation within the scope of their prescribed work.

SECTION 4. The secretary shall hold his office as long as he shall faithfully discharge the duties thereof, but may be removed for just cause at a regular meeting of the Board, a majority of the members voting therefor. He shall keep his office at the State capital, and shall perform the duties prescribed by this act, or required by the Board. He shall keep a record of the transactions of the Board; shall have the custody of all books, papers, documents, and other property belonging to the Board, which may be deposited in his office; shall, as far as practicable, communicate with other State boards of health, and with the local health committees within this State; shall keep and file all reports received from such committees, and all correspondence of the office appertaining to the business of the Board. He shall, as far as possible, aid in obtaining contributions to the library and museum of the Board. He shall prepare blank forms of returns, and such instructions as may be necessary, and forward them to the clerks of the several health committees throughout the State. He shall collect information concerning vital statistics, knowledge respecting diseases, and all useful information on the subject of hygiene, and, through an annual report, and otherwise, as the Board may direct, shall disseminate such information among the people.

SECTION 5. The secretary shall receive an annual salary which shall be fixed by the State Board of Health. The Board shall quarterly certify the amount due him, and on presentation of said certificate the Governor shall draw his warrant on the State Treasurer for the amount. The members of the Board shall receive no compensation for their services, but their travelling and other necessary expenses while employed on the business of the Board shall be allowed and paid.

SECTION 6. The sum of three thousand dollars per annum, or as much thereof as may be deemed necessary by the State Board of Health, is hereby appropriated to pay the salary of the secretary, meet the contingent expenses of the office of the secretary, and the expenses of the Board, which shall not exceed the sum hereby appropriated. Said expenses shall be certified and paid in the same manner as the salary of the secretary.

SECTION 7. It shall be the duty of the health committee in each town and city in the State, at least once in each year, to report to the State Board of Health its proceedings, and such other facts required, on blanks and in accordance with instructions received from said State Board. It shall also make special reports whenever required to do so by the State Board of Health.

SECTION 8. In order to afford to this Board better advantages for obtaining knowledge important to be incorporated with that collected through special investigations and from other sources, it shall be the duty of all officers of the State, the physicians of all incorporated companies, and the president or agent of any company chartered, organized, or transacting business under the laws of this State, as far as is practicable, to furnish to the State Board of Health any information bearing upon public health which may be requested by said Board for the purpose of enabling it better to perform its duties of collecting and distributing useful knowledge on this subject.

SECTION 9. The secretary of the State Board of Health shall be the Superintendent of Vital Statistics. Under the general direction of the Secretary of State, he shall collect these statistics, and prepare and publish the report required by law relating to births, marriages and deaths.

SECTION 10. The Secretary of State shall provide a suitable room for the meetings of the Board at the State capital, and office-room for its secretary.

SECTION 11. This act shall take effect when approved.

[Approved February 27, 1885.]

INTRODUCTORY.

The State Board of Health of Maine offers its First Annual Report with feelings of hopefulness for the future of sanitary progress in our State, and of gratitude to our fellow citizens for the kindly spirit of co-operation and of helpfulness which they have shown. The manifestation of public interest in the work of the Board is one of the most promising signs, for, as Lord Derby declared, "No sanitary improvement worth the name will be effective, whatever acts you pass or whatever powers you confer upon public officers, unless you can create an intelligent interest in the matter among the people at large." The Board is mindful of the significance of this truth, and looks upon it as one of its most binding obligations not only to diffuse information in regard to health matters, but also to create in regard to sanitation a living faith, which can come only from a knowledge of what has been done and therefore of what may be done. The growth of a perfect sanitary system, and the attainment of the best sanitary results, is not the work of a day nor of a year any more than was that great movement for political liberty which began before Magna Charta and is not yet complete.

The thought, therefore, of claiming for our few months' work results which may be used to point a moral would be absurd. Many of our American states and cities are now beginning to reap the results of sanitary work which many times repays for all public expenditures on its account; but to gain the best idea of the possibilities and worth of sanitation, we must look to that people whose government earlier than any other recognized the claims of public health on her legislators. As we are indebted to the mother country for the rich heritage of political and legal precedents, so to England we have had to look for guides and models in our public health work.

Two events, perhaps, more than any others were instrumental in awakening the English people and the English Government to the value of sanitation as an element of national prosperity. One of these was the recurring sweep of cholera over the civilized world. In 1832 in its western march it had visited England and again in 1848, with a still severer mortality. A third time, in 1854, it had left its home in Asia and was rapidly extending to Europe. At the same time, during the dark days of waiting before Sevastopol, after preventable disease, not Russian missiles, had destroyed one English army, the sanitary knowledge and the inspiration of a noble woman called into existence a system of military hygiene which saved a second army and showed a sickness-rate and a death-rate lower than would have been found amongst the men if they had been in their English homes.

The opportunity which the earlier visitations of cholera to Europe gave to sanitarians to study the disease in their own country was improved, and the intervals which passed between the several epidemics was diligently employed in investigating the history of its progress from place to place, and the circumstances and conditions which favored its spread. The intimate and indispensable relation which exists between domestic filth in its various forms and cholera was plainly shown, and this imported pestilence took its place in the catalogue of preventable diseases. The lesson which was taught by Florence Nightingale in the Crimea and by Mr. Chadwick and his associates at home were not lost to the English nation, and Parliament, by its enactments in 1855 and in succeeding years, has built up in England a more nearly perfect system of State Medicine than can elsewhere be found. Though England's course in this direction was accompanied with all the disadvantages and uncertainties which are incidental to all pioneer movements, the results have been so satisfactory that a judicious sanitary administration in local and national affairs is now recognized as a part of governmental duty, hardly, if any, less imperative than even an assurance of continued supremacy of the British marine. When Lord Beaconsfield said, as prime minister of Great Britain, that "the health of the people is the first duty of the statesman," he expressed only that which has become the sentiment of his nation; for the "intelligent interest in the matter among the people at large," which Lord Derby predicated as indispensable to a successful administration of the public health acts, can be found in no other country to such a degree as is there seen. The testimony which their vital statistics give is convincing. The argument which the lessening death-rates make is unanswerable.

Measures for improving the public health, consisting mostly in the introduction of sewerage, drainage and a pure water supply, and in the removal of filth, were begun in many of the unhealthy old towns some thirty or more years ago. Salisbury, one of these old towns, had borne an unenviable reputation for unhealthiness. The plague had ravaged it repeatedly, and once had destroyed one-fourth of its inhabitants; cholera in 1849 entailed a heavy mortality. In 1853 improvements were begun. For nine years before the improvements the death-rate had been 27 to the 1000; for nine years after, 21. Similarly, the mortality was reduced in Cardiff from 33 to 20; in Croydon from 23 to 18; in Macclesfield from 29 to 23, and in Newport from 31 to 21 in the 1000. The saving of life in these towns was respectively, 20, 32, 22, 20 and 32 per cent. At the same time with the improvement in the general death-rate there was a striking diminution in the deaths from particular diseases: thus, in these towns named, there was effected a reduction of the mortality from typhoid fever of 36 per cent. in the lowest, to 75 per cent. in the highest instance, and from consumption, a diminution of from 17 to 49 per cent.

These results were the outcome of the earlier efforts in England, but in 1872 and 1875 the Public Health Acts of those years inaugurated important changes. Increased powers were conferred upon local sanitary authorities, a more intimate sanitary supervision was established, and provisions were made for the appointment of local officers of health in both town and country districts. The good effect of this further legislation has gradually made itself apparent. We are told, in the Report of the Registrar-General for 1883, that the death-rate for England and Wales during the five years, 1876–80, was lower than usual, but that for the first three years of the present decade, 1881–2–3, it had been lower than had ever been recorded before.

But, perhaps, in no part of the kingdom have the results been more satisfactory than in the metropolis itself, for the reason that they have been won under the great disadvantages of an ever rapidly increasing bulk and density of population. From 1841 to the present time, the number of inhabitants has increased from 1,948,417 to over 4,000,000, and the average density from 25 to the acre to 50 to the acre. In the face of such adverse conditions the maintenance of a stationary death-rate would have been, as pointed out by Mr. Chadwick, a sanitary triumph, yet the showing is better than this. In 1840–49 the death-rate of London averaged 25.3, and for the last few years it has been about 20 to the 1000. Abstractly considered, this difference in death-rates is not so significant as a very simple calculation can make it. As applied to the population of London, the saving of five lives in the 1000 means the saving of 20,000 lives yearly, and the saving of three lives to the 1000 of the general population of England and Wales, which has been effected, means the saving of over 100,000 lives annually.

This modern movement to improve the public health has not been confined to England, but extended to Scotland, it has lowered the death-rate in Glasgow from 30 to 24 in the 1000, and diminished remarkably the amount of discomfort, pauperism and crime; to India, where it has reduced the death-rate in the last decade by two-thirds; to the English army, where it has brought the death-rate down from 18 to 8 in the 1000; to the navy, where the death-rate is only 5 to the 1000 in contrast with the death-rate of 18 which still exists in the merchant marine. It has furthermore encouraged and stimulated all the other peoples of the earth to study and to put into practical use that most profitable of all systems of political economy—public hygiene.

Among our own States, Massachusetts was the first, sixteen years ago, to establish a State Board of Health, and since then in pretty rapid succession, one State after another has taken its place until now there are but five that have not, through a State Board of Health, made provisions for a public health service. Our own State, in taking her place somewhat late among those that have given recognition to the claims of public hygiene on all modern government, has the advantage of the lessons of experience which others have learned, yet this procrastination has been costly in lives and needless sickness. In the same year, 1870, when Massachusetts created her State Board of Health, and in a few of the succeeding years, we were seeking to increase our population by the encouragement of foreign immigration. As the result of this we have our prosperous Swedish Colony which is a sufficient testimonial to the wisdom of that policy; but at the same time, and ever since, we have been losing every year needlessly by death, of those who are of our own flesh and blood, more lives than have come to us from Sweden. Every year, also, by preventable disease which does not end in death, the effective working power of our people is crippled many times more than it is reinforced by our industrious Northmen.

A careful examination of the communications from physicians in this report will suggest that, even in our own State, where the evils of crowding are not felt as they are in many places, and where the general death-rate is presumably lower than it is in many of the other States, there are many causes which lead to a higher sickness-rate and death-rate than ought to prevail. But if we should arrange the various causes under the few headings of polluted water, impure air, dampness or defilement of the soil beneath and about our dwellings, and criminal carelessness in the management of contagious and infectious diseases, we should include all the more potent causes of preventable sickness in all countries. A glance at this brief enumeration shows that telluric, climate and other conditions not subservient to the will of man has but little to do here. The water supply of our State when uncontaminated by human agency is of the purest and best, yet ignorance and carelessness makes the drinking water, even in the uncrowded farming communities, a fruitful source of disease. The air which moves over our hills and valleys is as pure as can be found, yet, in our homes, and schools, and churches, it is a heterogeneous mixture whose derivation and vileness if appreciated would not commend it to the fastidious. From our soil, malarial exhalations and malarial diseases never arise, yet serious, but avoidable, causes of disease very often spring from the ground which our habitations rest upon. With the world at large we suffer from the contribution which we are annually called upon to make to that most cruel of all Minotaurs—the group of zymotic diseases. We have sent this tribute year after year with the spirit of resignation befitting a people of less general intelligence and with fewer newspapers. By putting into practice some of the simplest and most easily learned of sanitary precepts in India, the death-rate from cholera has been reduced to a small part of its former prevalence. Yet the apathy or fatalism of many a New England village at times lets our less malignant diseases spread without restriction and present a death-rate which Bombay would call excessive.

Some careful nurses, with a long experience with scarlet fever, have never permitted the disease to spread from the first cases, and yet, in our communities, a case of scarlet fever which is not communicated to other children, if other susceptible ones are in the neighborhood, is the exception and not the rule. Many careful physicians give testimony to the efficacy of preventive measures in diphtheria. They teach that this disease may be greatly restricted if not stamped out entirely. But still, in our State, at diphtheria funerals in country places, parents with children at home, if not with them, attend, and in villages and cities the public hack with no subsequent disinfection carries the mourners. And these and many other sanitary delinquincies will continue and will be followed by their inevitable results and some thousands of unnecessary deaths will annually occur until the public comprehension grasps the idea that the heaviest of all taxation is that which preventable disease imposes. Then the public conscience will move the public will to say, as did Canute of old to the ocean, but with far more effect, "Thus far shalt thou come and no farther."

SECRETARY'S REPORT.

ORGANIZATION OF THE BOARD.

In accordance with the provisions of the "Act to establish a State Board of Health" His Excellency, the Governor, appointed the following-named persons as members of the State Board of Health:

FREDERIC H. GERRISH, M. D., Portland, for the term of six years.

Hon. LEWIS BARKER, Bangor, for the term of five years.

Hon. STEPHEN J. YOUNG, Brunswick, for the term of four years.

O. A. HORR, M. D., Lewiston, for the term of three years.

E. C. JORDAN, C. E., Portland, for the term of two years.

J. O. WEBSTER, M. D., Augusta, for the term of one year.*

The first meeting of the Board was held in the State House, Augusta, April 13, 1885. It was called to order by Dr. Gerrish, and Mr. Jordan was elected Secretary *pro tem*.

All the members being present and qualified, Dr. F. H. Gerrish was unanimously elected President of the Board.

In accepting the office, Dr. Gerrish expressed his thanks to his colleagues for the honor of the election, and briefly addressed them concerning the responsibilities and duties of their positions.

He said that there had been confided to them the general supervision of the interests of health and life of the citizens of Maine. For a long time the medical profession, acting through committees of the Maine Medical Association, had tried to persuade the Legislature of the necessity of establishing such a Board; but, until the session just finished, no success has attended these efforts. The act constituting the Board was passed without any serious oppo-

sition, and thus it is demonstrated that Maine at last recognizes, in some measure, the duties of a State in the direction of the preservation of the health of its people. Sixteen years ago, Massachusetts created the first State board of health in America, and now the great majority of the States have such organizations. Maine has, therefore, the advantage of their experience, but has purchased it by a delay which has been frightfully costly in human lives.

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* Re-appointed for term of six years, from January 31, 1886.

This State always has had a body of sanitary laws of considerable value; but they have been almost entirely inoperative, on account of the lack of a Board charged with the duty of enforcing them. The functions of the Board in this regard are set forth in the establishing act, and need not be rehearsed at this time. With the small appropriation which the Legislature made, it is impossible to execute all of these provisions at once; but some of them call for prompt attention. One of the most important is the collection of vital statistics. Nobody knows or can ascertain the number of births, marriages and deaths in this State in any year in the past. The local authorities of each town should be required to keep records of all these matters, and report to this Board weekly. Not only should there be a notification of deaths, but of disease also, so that the existence of an epidemic can be known immediately, its progress accurately traced, and means adopted for its arrest. The local boards must be instructed concerning their duties and their powers. An abstract of the sanitary laws of the State should be sent to each of them, and compliance with the provisions of these statutes insisted on. Every week a report of the health of the State should be published in one or more prominent newspapers. The press has been friendly to the movement for the improvement of the sanitary condition of the State, and can be depended on to give intelligent support to the efforts of this Board. These weekly reports will be looked for with interest by the best portion of the people, and the newspapers will take pains to supply the information with accuracy and promptness. Another function of very great importance is the instruction of the people in sanitary affairs. This can be accomplished in various ways,—by lectures, by public meetings, and hygienic conventions, by the distribution of health tracts, and by our annual reports.

All these things, however, will more properly engage the attention of the Board at its future sessions. At this meeting it will be

well to take action on several matters of detail: The securing of a suitable room for the business of the Board; the adoption of by-laws regulating the dates of the quarterly meetings, fixing the time of the annual meeting, and providing for the calling of special meetings; and the consideration of the question of appointing special committees on various sanitary topics. Finally, the most important item of business which calls for deliberation is the appointment of a secretary. As executive officer of the Board, his duties will be of the most exacting and, often, delicate character; and it is vitally necessary that he be a man thoroughly equipped for the position. Though the need of such help as this Board is expected to give to the people of the State is immediate and pressing, it will be better to delay final organization many months, rather than to choose for secretary one whose fitness for the position is not well attested.

This is not the time for a dissertation on the grandeur of the work in which the Board is to engage; each member already has settled convictions on that point, and brings to his position enlightened interest and willingness to labor for the accomplishment of the greatest possible good. On its success in the first two years of its life will depend the continued existence of the Board; for if the people are not satisfied of its utility, the Legislature will refuse to grant a sufficient appropriation for the prosecution of the required work. The future of sanitation in Maine, therefore, as well as its present, depends largely on the devotion, energy and wisdom of the individual members of this Board.

At an adjourned meeting of the Board held at Augusta, May 11, 1885, Dr. A. G. Young, of Fort Fairfield, was unanimously elected permanent Secretary.

Other meetings of the Board have been held as follows:

The third meeting on May 23, 1885;

The fourth, the regular quarterly meeting, June 29, 1885;

The fifth, a quarterly meeting, Sept. 28, 1885;

The sixth, the last quarterly meeting of the year, Dec. 28, 1885.

At the second meeting of the Board, there were adopted the following

BY-LAWS.

I. The quarterly meetings of the Board shall be held at the State House on the last Monday in March, June, September and December in each year. The meeting on the last Monday in March shall be the annual meeting.

II. Special meetings may be ordered by the President at such times and places as he may deem proper, and shall be called by the Secretary on order of the President, or on application of three other members of the Board.

III. The rules of parliamentary assemblies as contained in Cushing's Manual shall govern the meetings of the Board.

IV. There shall be appointed annually a finance committee of three members, of which the Secretary shall be one, which shall audit the accounts of the Board, and certify them, if found correct, to the Governor and Council.

The finance committee shall report its action at each quarterly meeting of the Board.

V. These By-Laws may be amended by a majority vote at any quarterly meeting, written notice of the proposed change having been given by the Secretary to each member, at least seven days before the meeting.

VI. No paper shall be published in the annual report of this Board except such as are ordered or approved for purposes of such publication by a majority of the members of the Board; and any such paper shall be published under the signature of the writer, who is entitled to the credit of its production, as well as responsible for the statements of facts and opinions expressed therein.

Recognizing that the diffusion among the people of information regarding sanitary matters is one of its most important duties, the Board has published and distributed extensively a series of circulars relating to health matters, and especially relating to the prevention and restriction of contagious diseases.

In getting these circulars before the public, the Board has been helped very greatly by the publishers of the various newspapers in the State, many of whom have printed them in full. This help we appreciate, and feel very grateful for it.

The first of the circulars that was sent out gave briefly what are now considered the essential points in school-house construction, from a sanitary point of view. This was hastened forth in the season of school-house building that it might, in the first year of the existence of the Board, help to shape the plans of the houses to be built. It is thought, that, as brief as it is, it was read with considerable interest and was productive of good. This circular is here reproduced.

[FORM 20.]

HINTS ON BUILDING SCHOOL-HOUSES.

Nearly one-sixth of the population of our State spends about six hours daily during a large part of the year in our school-rooms. This necessary confinement within the school-room walls, coming as it does during the growing period of the body, and while it is the most susceptible to harmful influences, entails certain evils which have been too generally regarded as necessary accompaniments of school life. It is well known, however, to those who have studied these questions carefully, that most of the diseases incident to school life are in quite a high degree preventable, and that one of the first and most important requirements in guarding against these diseases is to have the building of school-houses conform to a few rules which are generally recognized as essential elements in school-house construction.

The more important of these rules are the following:

Rule 1. School-houses should be built upon dry ground; if not dry, the lot must be deeply drained. Furthermore, proximity to swamps and other sources of stagnant water or of noxious exhalations should be avoided. The reason for this rule is the well-known fact that dampness of soil contributes much to make a school-house unhealthy. Very fatal school epidemics of diphtheria and similar diseases have been caused by exhalations from damp and filthy soil around and beneath the school-house.

Rule 2. School-rooms should be oblong, with their length somewhere nearly one-third greater than their width, and with the teacher's desk in one end.

Reason. In rooms of this shape the scholars are more easily observed and controlled, and such rooms are more easily lighted.

Rule 3. The glass surface of the windows should equal at least one-seventh or one-sixth of the floor surface.

Rule 4. The window sills should be placed never lower than **three and one-half feet** above the floor, and the windows should extend upward to near the ceiling.

Reason. The light which comes from considerably above the level of the desks and books lights them much better than the more horizontal rays. High windows also light the ceiling, whence the light is reflected downward upon the desks.

Rule 5. Windows should be placed on the sides of the room. Windows in the rear of the scholars are permissible, but in front of them **never.**

Reason. Light from the front is very trying to the eyes. Light from behind the scholars is not injurious to their eyes, but is disadvantageous for the teacher.

NOTE. If the school-room is not more than 23 or 24 feet in width, it may be lighted wholly from one side. Then the light is better from the left. In single-room school-houses it is better upon the whole to light from two sides with no windows behind the pupils. Then, when it can be done, let the school-house be placed so its windows may be on the north and south sides of the building.

Rule 6. Do not place the black-boards between or near the windows.

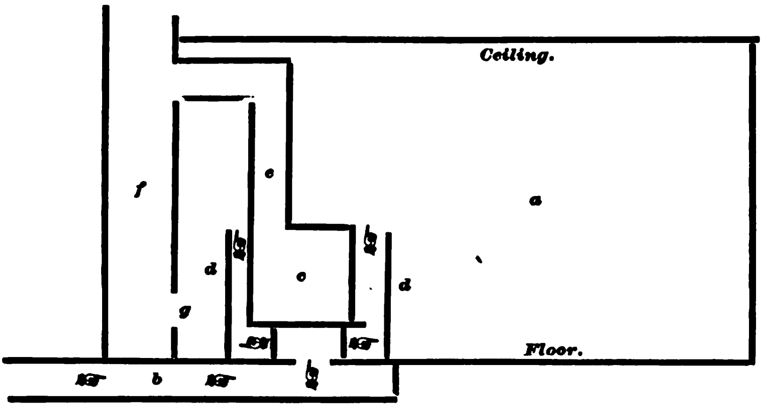
NOTE. This matter of lighting school-rooms has come to be regarded as very important, since it is found that near-sightedness and other very serious eye troubles are caused or intensified by faulty methods of lighting.

Rule 7. In rooms for study, each pupil should have 20 square feet of floor space, and this, with the height of twelve feet for the ceiling, will give 240 cubic feet of air space for each scholar. Ceilings should never be lower than twelve feet, and in ordinary rooms never much higher.

Reason. This amount of floor and of cubic air space is required to make efficient ventilation possible.

Rule 8. Never think that a school-room is completed until there is some way of getting fresh, warmed air into it and the foul, breathed air out. Ventilation costs something in fuel, but it is a penny-wise and pound-foolish policy which omits it. The apparatus to obtain it need, especially in small schools, cost but a few dollars.

An arrangement for heating and ventilating a school-room in an economical manner is given in the following straight-line illustration:



a represents the school-room; *b*, the fresh air box; *c*, the stove; *d*, *d*, the sheet iron jacket around the stove, enclosing its sides except the door; *e*, the stove pipe; *f*, the chimney, which serves as a smoke flue and at the same time as a ventilation flue, by leaving an opening near the floor level at *g*.

With this arrangement the cold air enters through the fresh air box, and passing through the opening in the floor, is warmed between the stove and the jacket which surrounds it. It then discharges itself into the room as fresh, warmed air. The colder and impure air along the floor is removed by the ventilating register or opening at the bottom of the flue.

If the house is already built and the chimney comes down only a little below the ceiling, the ventilation flue can be carried down to the floor by making another opening below that occupied by the stove pipe, and then putting in another pipe of tin or sheet iron with its lower opening near the floor.

These few hints on building school-houses it is hoped may be useful, especially to country districts. A fuller consideration of the important subjects of School Hygiene and School-House Construction the State Board of Health hope to include in the earlier volumes of their Report. In the mean time it would be a pleasure to the Board to answer any questions or make any farther suggestions, which school or municipal officers, or other interested persons, may desire.

Following closely the Hints on Building School-Houses, and demanded by the apparent exigencies of the times, a circular on cholera was published. This, it is hoped, was instrumental in giving the public correct views in regard to this disease, and assurance that cholera is amenable to preventive measures. Fortunately, however, America received an unusual slight from this disease, for which we have reason to be grateful. Hitherto invariably, after it has become epidemic in Europe, it has sailed the ocean with man and implanted itself upon our soil. This happened for the first time in 1832, when it was brought in emigrant ships to Montreal and Quebec. In the former city there was a mortality of 4000, and in the latter, nearly the same. For four years it prevailed on this continent and swept over a large part of North America. In 1848 it was brought to New York and New Orleans, and from the latter place it passed up the Mississippi Valley and reappeared in New York the following year in a fatal form. Its third epidemic prevalence in this country was in 1854, and its fourth in 1866, when it was again brought to New York and distributed to points south and west. The last epidemic visitation of cholera to America was in 1873, when it spread extensively through the Mississippi Valley. In 1884 it prevailed with a heavy mortality in southern France and in Italy, and this year, in Spain, with a fearful death rate. Many ports of southern Europe are infected with the germs of the disease, and there will be still required great watchfulness to guard American ports against the danger of infection.

[FORM 21.]

PRACTICAL FACTS ABOUT CHOLERA.

Cholera, as it appears in America, is an exotic disease: that is, it never arises spontaneously on our soil. Always when it has appeared here, it has been possible to trace it back to European ports and towns where cholera prevailed, and from there to India, where it always has its origin. Whenever it has left its Asiatic home and overrun and prevailed in Europe, as it did last year, it has invariably, sooner or later, found its way to our own country. If it does not appear among us in the near future, it will be a fortunate exception from its usual history. In view of the possibility of having to deal with Asiatic cholera in our own Commonwealth, the State Board of Health thinks it prudent to issue this circular.

NATURE OF THE MALADY.

It is a specific disease, caused by a specific organic poison or disease germ, derived directly or indirectly from preëxisting cases of the same disease.

SYMPTOMS.

The cholera almost always begins with a premonitory diarrhœa. Later come vomiting, cramps, exhaustion and collapse. In some cases the advent of the disease is sudden, and its course and termination rapid.

HOW IT IS SPREAD.

Cholera is an infectious disease, but it is infectious only in certain ways. It is not " catching," as small pox and scarlet fever are understood to be. In Calcutta, where cholera is always present, hundreds of cases have been treated in the general hospital, and often in the same rooms with patients sick with other diseases, without ever being a source of infection to them. Physicians and nurses who care for the sick are little, if any, more liable to take the disease than others. And yet, on the other hand, a single case may poison many other individuals, and give rise to a wide-spread and very fatal explosion of the disease. How can we account for this paradoxical behavior of cholera? In this way: The cholera poison exists principally in the discharges from the bowels and in the vomited matter. This excreted contagium is said not to be in an actively poisonous condition when it first leaves the body, but requires a little time to go through a fermentative stage during which its malignancy is developed. Conditions which favor the development of the poison are exclusion of fresh air, darkness, moisture and warmth, and, more than all else, filth conditions.

If this poison is completely destroyed as soon as it leaves the alimentary canal, there is no danger of the patient's being a source of infection to other persons. But, if the dejections are thrown, for instance, in the privy vault, the cholera germs find all the favoring conditions above named for their development and increase.

sition, and thus it is demonstrated that Maine at last recognizes, in some measure, the duties of a State in the direction of the preservation of the health of its people. Sixteen years ago, Massachusetts created the first State board of health in America, and now the great majority of the States have such organizations. Maine has, therefore, the advantage of their experience, but has purchased it by a delay which has been frightfully costly in human lives.

This State always has had a body of sanitary laws of considerable value; but they have been almost entirely inoperative, on account of the lack of a Board charged with the duty of enforcing them. The functions of the Board in this regard are set forth in the establishing act, and need not be rehearsed at this time. With the small appropriation which the Legislature made, it is impossible to execute all of these provisions at once; but some of them call for prompt attention. One of the most important is the collection of vital statistics. Nobody knows or can ascertain the number of births, marriages and deaths in this State in any year in the past. The local authorities of each town should be required to keep records of all these matters, and report to this Board weekly. Not only should there be a notification of deaths, but of disease also, so that the existence of an epidemic can be known immediately, its progress accurately traced, and means adopted for its arrest. The local boards must be instructed concerning their duties and their powers. An abstract of the sanitary laws of the State should be sent to each of them, and compliance with the provisions of these statutes insisted on. Every week a report of the health of the State should be published in one or more prominent newspapers. The press has been friendly to the movement for the improvement of the sanitary condition of the State, and can be depended on to give intelligent support to the efforts of this Board. These weekly reports will be looked for with interest by the best portion of the people, and the newspapers will take pains to supply the information with accuracy and promptness. Another function of very great importance is the instruction of the people in sanitary affairs. This can be accomplished in various ways,—by lectures, by public meetings, and hygienic conventions, by the distribution of health tracts, and by our annual reports.

All these things, however, will more properly engage the attention of the Board at its future sessions. At this meeting it will be

well to take action on several matters of detail: The securing of a suitable room for the business of the Board; the adoption of by-laws regulating the dates of the quarterly meetings, fixing the time of the annual meeting, and providing for the calling of special meetings; and the consideration of the question of appointing special committees on various sanitary topics. Finally, the most important item of business which calls for deliberation is the appointment of a secretary. As executive officer of the Board, his duties will be of the most exacting and, often, delicate character; and it is vitally necessary that he be a man thoroughly equipped for the position. Though the need of such help as this Board is expected to give to the people of the State is immediate and pressing, it will be better to delay final organization many months, rather than to choose for secretary one whose fitness for the position is not well attested.

This is not the time for a dissertation on the grandeur of the work in which the Board is to engage; each member already has settled convictions on that point, and brings to his position enlightened interest and willingness to labor for the accomplishment of the greatest possible good. On its success in the first two years of its life will depend the continued existence of the Board; for if the people are not satisfied of its utility, the Legislature will refuse to grant a sufficient appropriation for the prosecution of the required work. The future of sanitation in Maine, therefore, as well as its present, depends largely on the devotion, energy and wisdom of the individual members of this Board.

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[FORM 20.]

HINTS ON BUILDING SCHOOL-HOUSES.

Nearly one-sixth of the population of our State spends about six hours daily during a large part of the year in our school-rooms. This necessary confinement within the school-room walls, coming as it does during the growing period of the body, and while it is the most susceptible to harmful influences, entails certain evils which have been too generally regarded as necessary accompaniments of school life. It is well known, however, to those who have studied these questions carefully, that most of the diseases incident to school life are in quite a high degree preventable, and that one of the first and most important requirements in guarding against these diseases is to have the building of school-houses conform to a few rules which are generally recognized as essential elements in school-house construction.

The more important of these rules are the following:

Rule 1. School-houses should be built upon dry ground; if not dry, the lot must be deeply drained. Furthermore, proximity to swamps and other sources of stagnant water or of noxious exhalations should be avoided. The reason for this rule is the well-known fact that dampness of soil contributes much to make a school-house unhealthy. Very fatal school epidemics of diphtheria and similar diseases have been caused by exhalations from damp and filthy soil around and beneath the school-house.

of a stationary death-rate would have been, as pointed out by Mr. Chadwick, a sanitary triumph, yet the showing is better than this. In 1840–49 the death-rate of London averaged 25.3, and for the last few years it has been about 20 to the 1000. Abstractly considered, this difference in death-rates is not so significant as a very simple calculation can make it. As applied to the population of London, the saving of five lives in the 1000 means the saving of 20,000 lives yearly, and the saving of three lives to the 1000 of the general population of England and Wales, which has been effected, means the saving of over 100,000 lives annually.

This modern movement to improve the public health has not been confined to England, but extended to Scotland, it has lowered the death-rate in Glasgow from 30 to 24 in the 1000, and diminished remarkably the amount of discomfort, pauperism and crime; to India, where it has reduced the death-rate in the last decade by two-thirds; to the English army, where it has brought the death-rate down from 18 to 8 in the 1000; to the navy, where the death-rate is only 5 to the 1000 in contrast with the death-rate of 18 which still exists in the merchant marine. It has furthermore encouraged and stimulated all the other peoples of the earth to study and to put into practical use that most profitable of all systems of political economy—public hygiene.

Among our own States, Massachusetts was the first, sixteen years ago, to establish a State Board of Health, and since then in pretty rapid succession, one State after another has taken its place until now there are but five that have not, through a State Board of Health, made provisions for a public health service. Our own State, in taking her place somewhat late among those that have given recognition to the claims of public hygiene on all modern government, has the advantage of the lessons of experience which others have learned, yet this procrastination has been costly in lives and needless sickness. In the same year, 1870, when Massachusetts created her State Board of Health, and in a few of the succeeding years, we were seeking to increase our population by the encouragement of foreign immigration. As the result of this we have our prosperous Swedish Colony which is a sufficient testimonial to the wisdom of that policy; but at the same time, and ever since, we have been losing every year needlessly by death, of those who are of our own flesh and blood, more lives than have come to us from Sweden. Every year, also, by preventable disease which does not end in death, the effective working power of our people is crippled many times more than it is reinforced by our industrious Northmen.

A careful examination of the communications from physicians in this report will suggest that, even in our own State, where the evils of crowding are not felt as they are in many places, and where the general death-rate is presumably lower than it is in many of the other States, there are many causes which lead to a higher sickness-rate and death-rate than ought to prevail. But if we should arrange the various causes under the few headings of polluted water, impure air, dampness or defilement of the soil beneath and about our dwellings, and criminal carelessness in the management of contagious and infectious diseases, we should include all the more potent causes of preventable sickness in all countries. A glance at this brief enumeration shows that telluric, climate and other conditions not subservient to the will of man has but little to do here. The water supply of our State when uncontaminated by human agency is of the purest and best, yet ignorance and carelessness makes the drinking water, even in the uncrowded farming communities, a fruitful source of disease. The air which moves over our hills and valleys is as pure as can be found, yet, in our homes, and schools, and churches, it is a heterogeneous mixture whose derivation and vileness if appreciated would not commend it to the fastidious. From our soil, malarial exhalations and malarial diseases never arise, yet serious, but avoidable, causes of disease very often spring from the ground which our habitations rest upon. With the world at large we suffer from the contribution which we are annually called upon to make to that most cruel of all Minotaurs—the group of zymotic diseases. We have sent this tribute year after year with the spirit of resignation befitting a people of less general intelligence and with fewer newspapers. By putting into practice some of the simplest and most easily learned of sanitary precepts in India, the death-rate from cholera has been reduced to a small part of its former prevalence. Yet the apathy or fatalism of many a New England village at times lets our less malignant diseases spread without restriction and present a death-rate which Bombay would call excessive.

Some careful nurses, with a long experience with scarlet fever, have never permitted the disease to spread from the first cases, and yet, in our communities, a case of scarlet fever which is not communicated to other children, if other susceptible ones are in the neighborhood, is the exception and not the rule. Many careful physicians give

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all scarlet fever, and one attack prevents subsequent attacks. With children scarlet fever is one of the most infectious of diseases, withal we might term it a capricious disease. Sometimes a single individual may have the disease, while children who have never had it may escape, although exposed to its contagion in the same house. Again, the slightest momentary exposure may be sufficient to give the disease.

The poison of scarlet fever is very readily conveyed in clothing or other things even long distances. Such cases as this are so common that almost everybody knows of them: A person calls to enquire about his neighbor's child who has this disease, opens the door for just a moment, perhaps does not go in, walks a long way home, and then gives the disease to his own children.

The contagion may be preserved for many months in clothing or in rooms. An article, for instance a handkerchief or a doll, may be used by a scarlet fever child and then laid away, perhaps a year, and when unpacked give the disease to other children. A letter or a paper sent by mail may carry the disease, the hair of the head or the beard may carry it when the clothing has been changed and disinfected and this part of the body neglected.

After recovery, for several weeks at least, the scarlet fever patient continues to be a source of danger to others, as long at least as the skin continues to be rough and to give off its branny scales of desquamation, or peeling.

PREVENTION.

With all the subtle infectiousness of scarlet fever, preventive measures will be rewarded with marked results. Carefulness can keep the infection from being scattered abroad, and disinfection can utterly destroy its power to do harm.

Keep your children away from the disease and away from persons and things that have been where it is. Keep, also, all who have recently been sick with the disease and all who have been where it is away from your children. Scarlet fever is a dangerous and often a deadly disease, therefore it may sometimes be your duty in protecting your children to treat the grossly careless as a malefactor. This duty of protecting your family from the danger of scarlet fever is as clear and imperative as would be your duty to stay the hand that would carry a poisonous and possibly deadly draught to the lips of your child. One great reason for warding off scarlet fever is that after childhood this disease is not so fatal, and also after childhood the liability to take the disease is very much lessened. It therefore happens that many, escaping the disease in childhood, never have it, although many times exposed to it later in life.

RESTRICTION.

The scarlet fever patient should be put into a room by himself. It is better to have the room in the upper story and not near rooms inhabited by children. Before the patient is put into the room, remove everything possible which can catch and retain the poison of the disease, viz: carpets, useless curtains, unused clothing.

Have some person specially employed as a nurse who is not to visit other parts of the house where children are. No other person not needed should be allowed to visit the sick room, especially those who have children of their own or who must go where children are. The nurse while attending the patient should wear only such clothing as can be disinfected by boiling before she goes to other places.

The room should be ventilated as thoroughly and constantly as possible without incurring the danger of draughts. Especially during convalescence a chill is to be avoided. Ventilation is desirable, both on account of the patient and on account of diluting and letting out the poison of the disease so its concentration may not be a danger to others in the house.

Receive the discharges from the throat and nose upon pieces of linen or cotton cloth which are to be burned.

The discharges from the bowels and kidneys should be disinfected with Disinfectant No. 5, No. 6 or No. 2 in large quantity and buried some distance from the dwelling.

The utmost care should be taken with the clothing of the patient. Do not carry it from the sick room dry. When removed it should be dipped into a tub of Disinfectant No. 4 or No. 5, and afterward boiled in the solution.

No person from a house where scarlet fever is should go into public assemblies, such as schools, churches or concerts, or anywhere into the presence of children who have not had the disease. Much of the contagion of scarlet fever is in the scales which are thrown off from the skin during desquamation ; it is well to use frequently during this period inunction of some oil or other fatty matter to prevent the scattering of these infectious particles.

Persons who have had scarlet fever should never be allowed to go to school or mingle in any other way with the public for at least five weeks after the disappearance of the fever and the rash, and not then until the clothing is thoroughly disinfected, and the body has received a disinfecting bath, not omitting the head.

In case of death the body should be enclosed in a sheet thoroughly wet in disinfectant No. 4 or No. 5 and put into a tight coffin, which should not afterward be opened. The funeral should be strictly private, and in no case should children be permitted to be present.

After death or recovery disinfect the room thoroughly with Disinfectant No. 1. In addition to this burn all things of but little value which have been in the room, and disinfect by prolonged boiling clothing and furnishings which can be so treated.

[FORM 26.]

SMALL-POX,

ITS PREVENTION AND RESTRICTION.

Issued by the State Board of Health of Maine.

Small-pox is always the result of infection. The specific poison which is the cause of the disease is very active—a momentary exposure to it will often result in producing small-pox in the unprotected, and the vitality of the infection, under certain circumstances, is capable of being preserved a long time. The disease is dangerous and loathsome in the extreme, giving a high death rate in the unvaccinated, and hideously disfiguring and maiming many who outlive it.

The present generation from its own observation can have no adequate conception of the terrible devastation which this disease caused before the discovery of vaccination. In the large cities one-third of the deaths in children under ten years of age came from small-pox.

"Not a decade passed in which this disease did not decimate the inhabitants in one country or another, or over great tracts of country; so that it came to be more dreaded than the plague."

In France, 30,000 persons died annually from this disease; and in the whole of Europe from 400,000 to 450,000 perished yearly from the same scourge.

In Westphalia, where the death rate from small-pox was formerly 2,643 in the million of population, the annual mortality from the same cause declined to an average of 114 in the million from 1816 to 1850, under the influence of general vaccination. In Berlin the reduction was from 3,422 to 176; in Copenhagen from 4,000 to 200.

These facts will give us some idea of the benefit which has been conferred upon humanity by vaccination. Without the protection which it affords, nearly, if not quite, the olden, fearful rate of mortality would, in the course of a generation or two, be restored. Cleanliness and the observance of the general laws of health might avail a little, but only a little, in restricting this disease, which seems to have its being always in infection.

In a community or town well and thoroughly vaccinated there would be no possibility of a serious extension of small-pox. Neglect of this protection has, even in recent years, sometimes led to very disastrous and unprofitable results. Such a course in Philadelphia in the winter of 1871-2 cost the city in lives and paralyzed business twenty million dollars. And such neglect of vaccination in Montreal is at the present time imposing a heavy penalty on that city and its surrounding province, and at the same time, seriously threatening the New England States.

PREVENTION.

The all-important preventive measure is vaccination. In the face of the disease, vaccination, isolation and disinfection must go hand in hand.

Every child should be vaccinated in its earliest years, preferably before six months of age, and in case of danger of infection, the vaccination should be done at once, no matter how young the child is. Vaccination should be done again before puberty, and better before ten or twelve years of age. Afterwards vaccination should be *tried* as often as every six or seven years, or oftener if the person is subjected to probable danger of small-pox contagion.

Vaccination should be done only by competent physicians, and only with vaccine virus of undoubted reliability and purity, otherwise a sense of security is often felt when in fact protection is not obtained.

Should vaccination be made in only one place, or in several? is sometimes asked. The following, based upon the examination of

5,000 cases of small-pox in England, answers the question strongly in favor of inserting the virus in several places in the arm.

Percentage of deaths in :—

1.	Unvaccinated,	35 per cent.
2.	Vaccinated :—	
	Having one vaccine scar,	7.73 per cent.
	Having two vaccine scars,	4.70 per cent.
	Having three vaccine scars,	1.95 per cent.
	Having four vaccine scars,	.55 per cent.

In case of the presence of small-pox, immediate and careful vaccination should be made of all persons who have not recently been so protected. Even after known exposure to the disease, vaccination should be done any time before the actual appearance of the eruption. If done within two or three days after exposure it will often prevent the disease, or make it much lighter; and done later, there is reason to believe that even then it has a salutary effect upon the course of the disease.

When a case appears, enforce immediately strict isolation and quarantine of the patient, and this should be continued for at least two weeks after the recovery of the case, and after the crusts have all separated. When the patient cannot be removed to a hospital, but must remain in a private house, secure a room, if possible, on the uppermost floor and remove from it all articles and furnishings which will not absolutely be needed. For a nurse have some person who has been recently and successfully vaccinated or who has had the small-pox. Keep all others away from the room. All other persons in the house and neighborhood should immediately be vaccinated. In case of death the funeral should be strictly private and conducted under the direction of the Board of Health, Health Officer, or the attending physician.

The disinfection should also be done under the same authority. During the sickness all discharges from the patient should be plentifully treated with Disinfectant No. 5, No. 6 or No. 2, and then buried. All crusts should be burned.

Clothing should be immersed in Disinfectant No. 4 or No. 5, and then subjected to prolonged boiling. All articles which cannot be surely disinfected must be burned.

If death should occur the body should immediately be wrapped in a sheet wet with Disinfectant No. 5 or 4, and prepared as soon as possible for private burial.

The room and house should be very thoroughly fumigated with Disinfectant No. 1, and renovated with paper, paint and whitewash.

The following relates to an important matter, and the suggestions therein made have been successfully and for many years tested, not only in isolated homes, but in villages and towns of considerable size:

[FORM 23.]

Construction and Management OF EARTH CLOSETS.

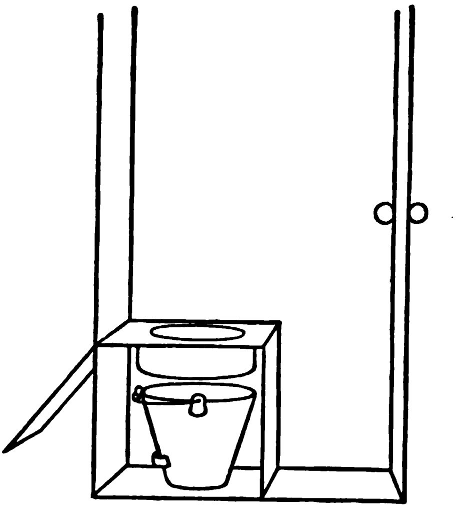
Issued by the State Board of Health.

In dealing with matters which affect the public health, it is generally admitted that one of the most important is that which regards the disposal of human excreta. Where a sufficient water service and skilful plumbing can be secured, there is no doubt that the use of our modern improved water-closets is as near to the unobjectionable as need be; but in the great majority of houses in this State, geographical position or the want of means makes it necessary to substitute something else. What we actually find in general use is that most abominable privy system—objectionable on the score of health for tainting the air with poisonous vapors, and polluting soil and water, and objectionable, *decidedly*, on the score of decency and comfort.

In most country and village places, the best substitute for the common privy is undoubtedly the dry-earth closet. Some of the advantages of this are that the earth when properly used is a good antiseptic and deodorizer, therefore preventing the dangerous and unpleasant gases of putrefaction; that it is inexpensive; that it requires but little trouble to manage it; that on account of its inoffensiveness when well managed, it may be placed in more convenient proximity to dwelling-houses.

There are some patented devices for using the dry earth, but without patronizing these, any carpenter or other person with only ordinary mechanical ingenuity can get up something which will give good results. All that is needed is a common closet, a supply of dry earth, a water-tight receptacle beneath, and a convenient way of disposing of its contents at quite frequent intervals.

The receptacle should be wholly above the surface of the ground, and may consist of a metallic-lined box, a half of a kerosene barrel with handles upon it for removal, or, which is better, a large galvanized iron pail.



The receptacle may be removed through a door in the back of the closet or in front of the seat, or, by having the seat hinged and made to button backward, it may be removed that way. The earth should be common garden or field loam, if considerably clayey all the better, but it must be finely pulverized. Road dust does well, but sand is not suitable. Coal ashes are also good. Whichever of these is used should be dry and screened through a sieve with about quarter inch meshes. The dry earth may be kept in a box or bin so arranged, where it can be, that it may be filled from the outside of the closet, or it is quite convenient to have one-half the seat hinged and beneath it the small compartment to hold the present supply of the earth. In this box or bin holding the earth there may be a small tin scoop which may be employed in sprinkling in the earth, a pint or more, each time the closet is used. The main thing is to use enough of the earth to completely absorb all liquids, and this requirement, of course, precludes the throwing of slops into the closet. One or two loads of the earth will be needed annually for a small family.

To correct a too prevalent misapprehension this little tract was sent out:

DOES VACCINATION PROTECT?

We find that the correct answer to this question is not as clearly in the minds of the people generally as it should be, therefore these facts are given. Almost one hundred years ago Jenner discovered that when a person is inoculated with cow-pox virus so as to have cow-pox, the attack of this lighter disease gives immunity from the much more dangerous disease, small-pox. The announcement of his discovery was met with incredulity. Jenner had vaccinated a boy eight years old who had never had the small-pox. He said to the incredulous medical men of the day: "If you think the boy is not protected from small-pox give him the small-pox if you can." They did not shut him up with small-pox patients, but they used a surer method. They inoculated the boy with the small-pox virus. It did not take. They tried it again with the same results, and repeated it many times carefully until the inoculation had been done twenty times with twenty failures. Then they had to acknowledge that the boy was protected.

The most common popular fallacy in this matter is that vaccination does not prevent one from having small-pox, but only makes the disease milder if one gets it. The truth is that when successfully done, and not done too long ago, the protection is almost absolutely perfect.

In Brussels, out of more than 10,000 children vaccinated in 1869-70, not one case was reported as having been attacked by the terrible epidemic of small-pox which swept over Europe soon after. Dr. Warlomont, who reported these facts, says that he has made a number of appeals for information as to cases of small-pox after vaccination with the animal virus, but so far without result. Others have made similar requests, and have offered large rewards for such information, but without avail.

In a severe epidemic of small-pox, which swept over the island of Hayti in 1881-2, Dr. Terres says that although attending two or three hundred severe cases every day, neither he nor any of his family or servants took the disease (thirteen persons in all), their only protection being successful vaccination. The scholars and teachers of three schools (five hundred in all) were successfully vaccinated, and only one case occurred. Dr. Terres states that not a single death occurred among vaccinated persons.

Dr. Dunn, of Minnesota, contrasts the histories of two families, one vaccinated and the other not. "The families are of the same size, living a few miles apart. The ages are nearly the same. On account of carelessness or parsimony neither family had been vaccinated. The small-pox enters one, still they take no preventive measures. The disease has the same scope as it had in the days before vaccination, and it quickly shows itself to be the same old pest that it was before the immortal Jenner robbed it of its terrors. Of the nine unprotected persons it rapidly destroys three, ruins an eye for yet another, and scars the other five, four of them girls, in a frightful way.

"The other family of ten hear that they have been exposed to small-pox, not aware that the disease has already been for ten days operating in the system of one of its members. They are vaccinated with reliable bovine lymph. Two days later one of the ten comes down with small-pox, which runs a mild course. They are all daily and nightly exposed to the disease, their vaccinations work well and not one of them is attacked."

Dr. Henry Tomkins, Medical Superintendent of the Fever Hospital belonging to the Manchester Royal Infirmary at Monsall, in a paper read at Owens College, said:

"The most striking of all evidence is, perhaps, that derived from the small-pox hospitals themselves. Here the protective influence of vaccination is seen and proved in a manner beyond all cavil. At Highgate, during an experience of forty years, no nurse or servant having been re-vaccinated has ever contracted disease, and evidence of the same character I can myself bring forward; for during the whole time that I have had charge of the fever hospital more than a thousand cases of small-pox have passed under my care, yet no servant, nurse, porter, or other person engaged there, has, after re-vaccination, ever taken it, though exposed daily to infection in its most concentrated form. Again, among all the students who, during the past two years, have attended the hospital for clinical instruction, not one has suffered, all having been re-vaccinated before being permitted to enter the small-pox wards."

Dr. O. W. Wight, Health Officer of Detroit, says: "During the winter of 1881-82, when small-pox was epidemic, I allowed fourteen well persons to go to the pest-house in the city of Detroit, who wished to take charge of other members of their families removed there on account of the disease. All of them were vaccinated at the time of going. Not one of them had even a light attack of varioloid. When the anti-vaccinationists will show half, or even quarter, the number of unvaccinated persons exposed in the midst of the sick and the dying to concentrated contagion without the least injury, I will then listen patiently to their arguments."

Facts and cases by the hundred, throwing the weight of their testimony all in the same direction, could be culled from sanitary and medical literature, but these few probably sufficiently show that vaccination protects a person from "catching" small-pox. If the vaccination is imperfect, or done many years ago, it still may be worth much in mitigating the disease and converting it into "varioloid."

MAINE STATE BOARD OF HEALTH.

RULES AND REGULATIONS
FOR
LOCAL BOARDS OF HEALTH.

CIRCULAR TO MUNICIPAL OFFICERS.

The State Board of Health hereby calls attention to the law which requires the municipal officers of a town to perform all the duties of health officers, unless the town, at its annual meeting, has chosen a health committee, a health officer, or a board of health. [Revised Statutes, chapter 14, sections 14, 15 and 34.]

The necessity of strict compliance with sanitary laws, at all times apparent to those familiar with the subject, is peculiarly urgent at the present time, when this country is threatened with an invasion of epidemic cholera; and the State Board of Health, desirous of aiding in the discharge of their duties those to whom are entrusted the interests of health and life in the various towns of Maine, issues this circular of instructions.

It is earnestly recommended that the health officers in each place prepare a series of rules and regulations based on the accompanying model, and secure their adoption as by-laws of the town (or ordinances of the city). In some places outside of cities, and large towns and villages, the rules relating to house-drainage will not be needed; but no other section can be omitted without great disadvantage. The regulations when adopted should be printed in convenient form, and a copy placed in every household. Without this universal diffusion of information, the desired result cannot be attained.

This circular should be handed to the health board, health committee, or health officer, if one already exists in the town; and the chairman of the body for which it is intended will please acknowledge its receipt on a postal card, directed to

A. G. YOUNG, M. D.,
Secretary of the State Board of Health,
AUGUSTA MAINE.

BY-LAWS

OF THE

Town of..

RELATING TO PUBLIC HEALTH.

In pursuance of authority given in Chapter 3, Section 59, and in Chapters 14, 16, 17 and 128 of the Revised Statutes of the State of Maine, the Town of.... ....hereby establishes and promulgates the following rules and regulations for the better preservation of the public health and for protection against infectious and contagious diseases.

CONTAGIOUS DISEASES.

RULE 1.

Any householder in whose dwelling there shall occur a case of scarlet fever, diphtheria, typhoid fever, small-pox, cholera or typhus fever, shall immediately notify the Board of Health (or Health Committee) of the same.

RULE 2.

When a physician knows or suspects that any person to whom he has been called is sick with, or has died of, one of the diseases named in Rule 1, he shall immediately notify the Board of Health (or Health Committee) of the same.

RULE 3.

A rigid quarantine shall be put upon any person sick with scarlet fever, diphtheria or small-pox for a period of at least three weeks, or until the Board of Health shall permit the quarantine to be removed. During this period all persons not necessarily in attendance there shall be excluded from the patient's room.

RULE 4.

The attending physician and others in charge of any person suffering from any of the diseases named in Rule 1, shall cause all discharges from the bowels to be thoroughly disinfected with Disinfectant No. 2.

RULE 5.

The clothing and bed-clothing of persons sick with the diseases mentioned in Rule 1 shall be disinfected by soaking in Disinfectant Solution No. 4, and shall afterward be boiled.

NOTE.—Better boil first in the solution.

RULE 6.

Any person having scarlet fever, diphtheria or small-pox, and members of any household where any of said diseases, whether mild or malignant, exist, shall refrain from mingling with children in schools, churches, Sunday-schools, or other indoor places; and associations with adults shall be as restricted as possible.

RULE 7.

Rooms, with their furniture, in which there has existed a case of scarlet fever, diphtheria, small-pox, cholera, or typhus fever, shall be thoroughly fumigated with sulphur, according to the directions given for using Disinfectant No. 1.

RULE 8.

A public funeral shall not be held for any person who has died of scarlet fever, diphtheria, small-pox, cholera, or typhus fever (*not typhoid*).

VAULTS AND DRAINS.

RULE 9.

No privy vault, cess-pool, or reservoir, into which a privy, water-closet, stable or sink is drained, except it is water tight, shall be established or permitted within one hundred feet of any well, spring, or other source of water used for drinking or culinary purposes.

NOTE.—No person can long do the work of the physician or sanitarian without being personally cognizant of the fact that water polluted from the sources indicated above is a cause of disease much oftener than the public generally suspects. Not only fatal domestic pestilences which break up the family circle, but long-continued indispositions, which may eventuate in fatal disease, are so produced. In some localities wells are fouled from privies and drains more than one hundred feet distant.

RULE 10.

All privy vaults, cess-pools, or reservoirs named in Rule 9, shall be cleaned out twice a year, once in the spring, not later than the 15th of May, and once in the autumn, not earlier than the 15th of October. From the 15th of May to the 15th of October of each year the above-named vaults, cess-pools or reservoirs shall be thoroughly disinfected by adding to the contents of the vault, once every week, from one to four gallons of Disinfectant No. 3, according to the size of the vault.

NOTE.—The householder who tolerates the above-mentioned places on his premises, keeps a possible and very often a great danger hanging over himself and family. The fermentation of the contents of these vaults fills the air around with poisonous gases and the specific germs which produce disease. Hence frequent cleansing and disinfection are required to make them *tolerably* safe.

RULE 11.

Earth privies and earth closets, with no vault below the surface of the ground, shall be excepted in Rule 9; but sufficient dry earth or coal ashes must be used daily to absorb all the fluid part of the deposit, and the entire contents must be removed at least monthly.

NOTE.—It is earnestly recommended for country and village places that the dry-earth system take the place of the very objectionable privy vault. To all who desire it the State Board of Health will send a circular giving directions for the construction and management of the dry-earth closet.

RULE 12.

All sewer drains that pass within fifty feet of any source of water used for drinking or culinary purposes shall be water tight, and in sandy soil the limit shall be eighty feet.

RULE 13.

No sewer drain shall empty into any lake, pond, or other source of water used for drinking purposes, or into any standing water, within the jurisdiction of this Board.

HOUSE DRAINAGE.

RULE 14.

The sewage from each building on every street provided with a common sewer shall be conducted into said sewer.

RULE 15.

That portion of the house drain which is outside of the building and more than four feet from the foundation walls, shall be constructed of iron pipe or vitrified drain-pipe.

RULE 16.

That portion of the drain pipe outside or under the building, and within four feet of the foundation walls, together with the soil pipe, shall be constructed of cast iron with leaded joints. The waste pipe connected with the conductors from the roofs, and other pipes inside the building, or outside and within four feet of the foundation walls, shall be constructed of iron with leaded joints.

RULE 17.

The house drain and other pipes for the conveyance of sewage shall be laid with uniform grade and with a fall of not less than one inch in four feet, except in those cases where the Board of Health may permit otherwise.

RULE 18.

The main house drain shall be provided with a trap, which shall be located outside the house walls and beyond all house connections. All pipes connecting a water-closet with a soil pipe shall be trapped, each separately, and close to the connection with each water-closet. All waste pipes shall be trapped, each separately, and close to the connections with each bath, sink, bowl, or other fixture.

RULE 19.

All soil pipes shall be carried at their full size through the roof and left open. A provision shall also be made for admitting air to the house-drain side of the main trap.

RULE 20.

The joints in the vitrified pipe shall be carefully cemented, under and around the pipe, and the joints in the cast iron pipe shall be run and calked with lead.

RULE 21.

All changes in direction shall be made with curved pipes, and all connections shall be made with Y branch pipes. All joints and pipes shall be made air tight. The whole work shall be done by skilful mechanics in a thorough and workmanlike manner, and satisfactorily to the Board of Health.

RULE 22.

Before proceeding to construct any portion of the drainage system of a hotel, tenement, dwelling-house or other building, the owner, builder or person constructing the same, shall file with the Board of Health a plan thereof, showing the whole drainage system, from its connection with the common sewer to its terminus in the house, together with the location and sizes of all branches, traps, ventilating pipes and fixtures.

RULE 23.

All drains now built shall be reconstructed, whenever, in the opinion of the Board of Health, it may be necessary.

GARBAGE.

RULE 24.

The collection of refuse matter in or around the immediate vicinity of any dwelling-house or place of business, such as swill, waste of meat, fish or shells, bones, decaying vegetables, dead carcasses, excrement, or any kind of offal that may decompose and generate disease germs or unhealthy gases, and thus affect the purity of the air, shall be considered the worst kind of nuisance, and must be removed or disposed of either by burial, burning or otherwise, and in such manner that it may not be offensive to the neighborhood wherever located.

RULE 25.

No dead animal shall, within the jurisdiction of this Board, be put into any river, well, spring, cistern, reservoir, stream or pond.

RULE 26.

Owners of fish or other markets must dispose of their offal in such manner as not to be offensive or dangerous to health.

MISCELLANEOUS.

RULE 27.

No diseased animal or its flesh, and no decayed, diseased or unfit meat, fish, vegetables or fruit, or diseased, impure or adulterated milk, or other impure, diseased or adulterated article used for food, shall be sold or offered for sale as food.

RULE 28.

No pupil shall be allowed to attend the public schools who has not been vaccinated successfully within seven years.

RULE 29.

The crowding of tenement houses will receive the special attention of the Board of Health, as one of the most prolific sources of contagious disease. Owners of such property, where cases of over-crowding are found, will be duly notified, and disregarding such notice, the case will be dealt with according to law.

RULE 30.

Swine shall be kept in such place and manner as not to be offensive to the persons residing in the vicinity; and their pens and yards must be kept deodorized by the application of dried muck, dry earth, or some other effective absorbent. The same rule, with regard to deodorization, applies to horses, cows and other stock.

RULE 31.

No person shall occupy any building as a slaughter-house, where it is offensive to any portion of the community. Such slaughter-houses will be treated as public nuisances.

RULE 32.

When a physician is in attendance on a case of infectious disease, the disinfection, which is required in Rules 4, 5, 7 and 10, shall be carried out according to his directions; otherwise it shall be done as specified in said rules.

RULE 33.

The violation of any of the foregoing Rules and any interference with the Board of Health to prevent the execution and enforcement of them shall be punishable by fine not exceeding twenty dollars for each offence, in addition to the liability to such punishment as is provided by the Revised Statutes of the State of Maine for specific offences.

The law makes it the duty of the Board to report from time to time upon text-books on the subject of hygiene for the use of the schools. The Committee chosen to attend to this matter reported after a careful and somewhat deliberate examination of fifteen or sixteen different works of this kind. The report drew upon us the criticisms of some who command our respect for the good work which they have done and are doing. It is clear that their line of usefulness lies parallel with that of the Board of Health, and therefore there should be no misunderstanding. What there has been, it seems is the result of mistaking a part for the whole. Intemperance is one of the most fruitful causes of disease as well as crime and misery, but the use of alcoholic liquors is only one of the causes which contribute to the disastrous total of preventable disease in our country. The people need instruction in reference to the effects of alcoholic drinks, stimulants and narcotics, and also regarding the many other things which make the body susceptible to the contagion of the "pestilence which walketh in darkness."

The consideration that our duty lay in this broader field made it imperative to report in accordance with the provisions of Chapter 286, Section 2, of the Laws of 1885.

STATE BOARD OF HEALTH.

REPORT ON TEXT-BOOKS ON PHYSIOLOGY AND HYGIENE.

The law creating the State Board of Health prescribes that it "shall from time to time examine and report upon works on the subject of hygiene for the use of the schools of the State." As the season is at hand when school committees decide upon the text-books to be used during the coming year, the Board considers it timely to make recommendations in this connection.

It is very important that teachers should have a greater knowledge of the subjects taught than is contained in the text-books which are used by their pupils; and, consequently, it is advised that they study carefully Martin's The Human Body (H. Holt & Co., New York), the unabridged edition, the advertised price of which is only $2.75; or Huxley & Youmans' Physiology and Hygiene (D. Appleton & Co., New York), a smaller work, but remarkable for its method and clearness. Those who have little children to teach will get good suggestions as to the best system of presenting physiological truths to the very young from Misses Buckelew and Lewis' Practical Work in the School-Room, Part 1, (A. Lovell & Co., New York), but they are warned that much of the science in the little book is such only in name.

For use in high schools, Martin's The Human Body, briefer course, (H. Holt & Co., New York), or Walker's Anatomy, Physiology and Hygiene (A. Lovell & Co., New York), is recommended. The above-mentioned work of Huxley and Youmans would be given the preference for this grade, but for the fact that, having been written some years ago, it does not present the subjects with special reference to the action of stimulants and narcotics upon the human system, and recent legislation insists upon the emphasizing of this point. A well-informed teacher, however, could supply this deficiency by oral instruction.

For ungraded high schools in small towns we recommend Blaisdell's Our Bodies and How we Live, (Lee & Shepard, Boston). This is a more elaborate work than the one next mentioned, and we give it the preference, also, for the higher grade of grammar schools. Its descriptions of illustrative experiments are particularly useful, and, in the hands of a capable teacher, it is suitable for use in the common schools.

For most schools of the grammar grade, and for the ordinary district schools, a hearty endorsement is given to Smith's The Human Body and its Health, (Ivison, Blakeman, Taylor & Co., New York).

Primary schools will find an excellent book in Smith's Primer of Physiology and Hygiene (Ivison, Blakeman, Taylor & Co., New York), which is simple and plain, and yet correct.

As some objectionable books have been issued and diligently pushed by their publishers, the Board thinks it best to put committees on their guard against them. The worst of those examined is Brands' Lessons on the Human Body, which was evidently written by one who has learned what little he knows about anatomy and physiology from antiquated sources, and not learned it well, and who considers wholesale condemnation of alcohol the best method of dealing with the question. Johonnot and Bouton's How We Live is hardly less objectionable than Brands' book, and is another good illustration of zeal without knowledge. Hygiene for Young People, prepared under the direction of the W. C. T. U., has too little instruction concerning the care of the body generally, and gives a rabidly one-sided view of the alcohol question. Even children will detect the fallacy of many of its statements, and will thus lose faith in all associated teachings. Intemperance of speech is not conducive to temperance in living.

F. H. GERRISH, M. D.,
O. A. HORR, M. D.,
J. O. WEBSTER, M. D.,
A. G. YOUNG, M. D.,
} *Committee.*

SMALL-POX.

Fortunately for the lives and prosperity of our Commonwealth, during this year just past, while a neighboring province and neighboring towns with which we are pretty closely bound by social and commercial relations, as well as by geographical nearness, have been sorely afflicted, we have escaped with a very few cases of small-pox within our borders. The history of the cases in our own State might be briefly and quickly told, but a prefatory glance at the origin and course of the epidemic which has troubled our provincial neighbors, and the precautions that the Board of Health has taken to prevent the introduction of the scourge into our own towns, may be neither unprofitable nor uninteresting.

For some years before Feb. 25, 1885, there had been no cases of small-pox in Montreal. On this date a Pullman conductor by the name of Shattuck came to his home on Mayor Street sick with small-pox. The house was isolated, disinfectants used, and Shattuck recovered. Unfortunately, two young ladies left the house as soon as they learned the nature of the disease and before the quarantine had been put on the house. One of these young ladies went to St. Andrew's, where she fell into intelligent hands and was so cared for that when she fell ill with small-pox, no other cases resulted at that place. The other young lady also became sick, but was persuaded to return to the infected house on Mayor Street. No other cases in the city could be traced to these.

On the 28th of February, it happened that another Pullman conductor by the name of Longley, on an incoming western train, was found with small-pox. He was carried to the Hotel Dieu and admitted into that hospital, and placed in a room with another patient who did not have small-pox. A few days after this he was transferred to another room with another patient who had not small-pox. The disease was mild in the case of Longley and he left the hospital on March 21.

At the time of his admission into the Hotel Dieu, there were about 240 patients in the hospital, and it seems that no precautions whatever were taken to prevent the spread of the disease to these other patients; so we read that a few days after the departure of Mr. Longley, a servant of the Hotel Dieu came down with the disease and died on April 1. A few days later her sister was taken, two days afterward two other cases, and on the 10th of April two more cases. Between April 8 and 18, there were sixteen patients with small-pox transferred from the Hotel Dieu to the Civic Hospital.

On April 14th, the Medical Faculty of the Hotel Dieu proposed to the Sister Superior to dismiss all the patients who seemed to have no symptoms of the contagion, and who could go home, and this they actually did! Fifty or sixty of the patients remained, the remainder were scattered over the city.

These initial proceedings in sowing the seeds for an epidemic need no comment here further than to say they were ultimately abundantly successful.

The first death from small-pox in Montreal was on April 1. Including this, the deaths from this cause in the city were, by months, as follows:

April	6
May	10
June	14
July	46
August	239
September	659
October	1,393
November	633
December	165
Total	3,164

In comparison with this the following table has some interest as showing the mortality from small-pox during the last ten years: —

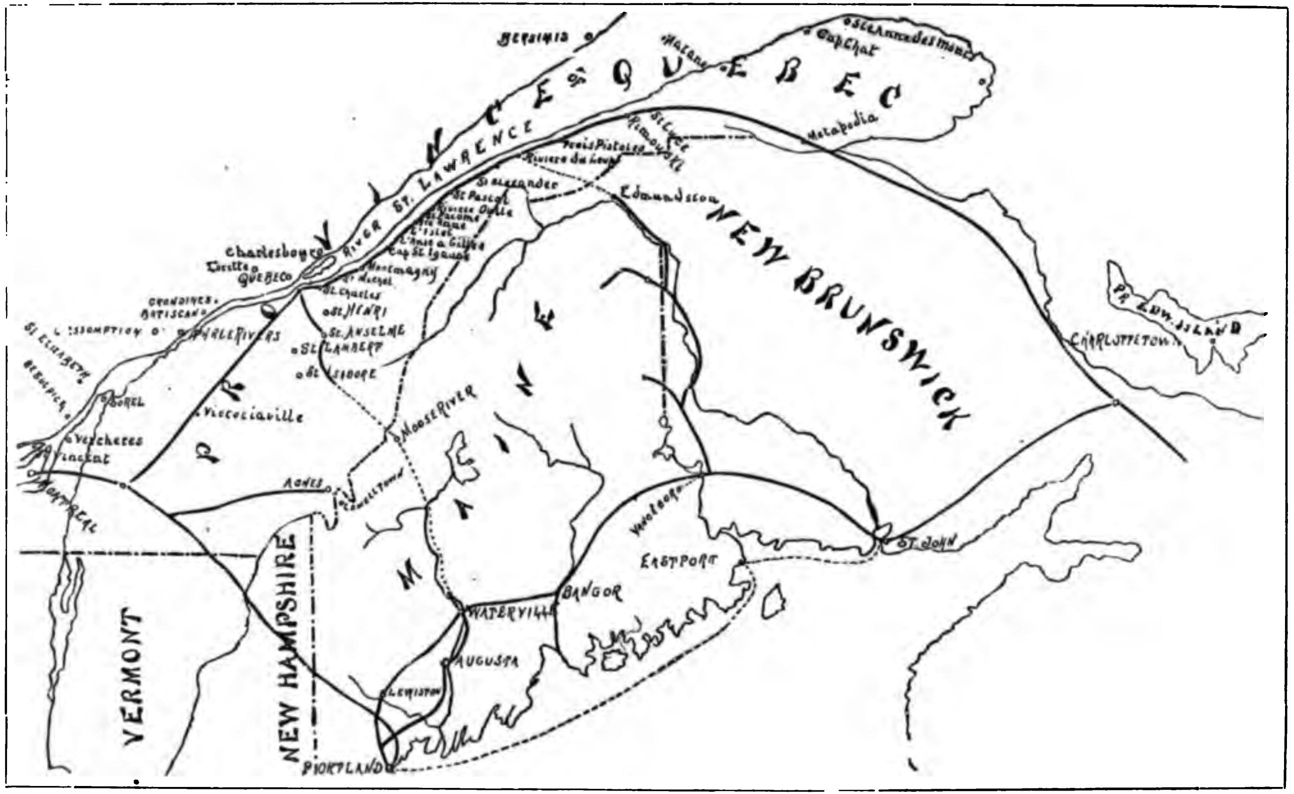
1875	509
1876	703
1877	506
1878	728
1879	475
1880	140
1881	5

1882	0
1883	0
1884	0
1885	3,164

The disbursements of the Health Department in the city for special small-pox work, from the beginning of the epidemic to Dec. 31, 1885, were, according to statement of the City Auditor, as far as the accounts had come in, $137,770.60.

This exhibit of the actual expenditures of the city in combating the epidemic, whether it were this which is shown, or whether it were doubled or trebled, is no true measure of the loss and the suffering which this calamity has entailed. As actual loss must be estimated the worth of the human lives which have been prematurely cut off; the time lost by sickness; expenses incurred in caring for the sick; expenses of burials; loss by diminution of trade and manufacturing industries; loss to railways, steamboats and local carriers; loss to hotel keepers;—all these, and other items, must come into the account in making up a true estimate of the real cost of Montreal's calamity. Such an estimate of the "Cost of a Great Epidemic to a Great City" was made by Dr. Benj. Lee, for the epidemic of small-pox which prevailed in Philadelphia in 1871-2. This epidemic, as regards the number of deaths, was not very far from the number that have occurred in Montreal, and it was conclusively shown that the cost to his city was over $21,000,000.

Thus briefly with facts and figures we have represented the status of affairs in Montreal which, in the early months of its existence, called upon the Board of Health to take measures to guard our Commonwealth from impending danger. Very incomplete, however, would be the presentation of the situation of our State, if we ceased with an account of the prevalence of small-pox in Montreal alone. As the original case in the Hotel Dieu, which started the Montreal epidemic, was a source of contagion for his fellow patients; so Montreal, on a larger scale, was a source of danger and of infection for her sister towns. The other border States and the Province of Ontario, as well as the State of Maine, quite early took measures to prevent the importation of the disease, and with very satisfactory results; but over the Province of Quebec the course of the disease was practically unrestricted. As a result we have now, while Montreal's daily small-pox mortality has dwindled down within the


PROVINCE of QUEBEC
RIVER ST. LAWRENCE
NEW BRUNSWICK
MAINE
NEW HAMPSHIRE
VERMONT
PR. EDW. ISLAND
CHARLOTTETOWN
Bersimis
Matane
Cap Chat
Ste Anne des Monts
Metapedia
St Luce
Rimouski
Trois Pistoles
Riviere du Loup
St Alexander
Edmundston
St Pascal
Riviere Ouelle
St Pacome
Ste Anne
L'Islet
L'Anse a Gilles
Cap St Ignace
Montmagny
St Michel
St Charles
St HENRI
St ANSELME
St LAMBERT
St ISIDORE
Charlesbourg
Lorette
QUEBEC
GRONDINES
BATISCAN
L'ASSOMPTION
THREE RIVERS
St Elizabeth
St Sulpice
SOREL
Vercheres
Vincent
MONTREAL
Victoriaville
MOOSE RIVER
AGNES
COWELLTOWN
VANCEBORO
ST. JOHN
EASTPORT
BANGOR
WATERVILLE
AUGUSTA
LEWISTON
PORTLAND

compass of a single figure, the disease scattered over this unlucky Province from Ontario to the Gulf of St. Lawrence.

The accompanying sketch map of Maine, the Province of Quebec, and the Maritine Provinces, will give, through the eye, a better idea of the distribution of the disease, and of the relative position of our State, than any unaided verbal description could give. All the towns whose names on the map are down in the Province of Quebec, either have had, or now have, cases of small-pox. In some of these places there have been severe local epidemics, especially on the St. Lawrence below Quebec. For instance, in Cap St. Ignace there were at one time in October fifty cases, and cases are still (Jan. 20) reported in that place; in Rimouski, Nov. 12, nine cases; Riviere du Loup, Nov. 4, eight cases; L'Islet, Nov. 10, eleven cases, and cases there yet; Ste. Anne, to date nearly one hundred cases. Altogether, up to the present time, there are known to this office, outside of Montreal and its suburbs, 131 towns in the Province of Quebec which are affected with small-pox, or have been since the beginning of the epidemic in Montreal.

Some of the causes which led to the infection of Montreal and the subsequent extensive distribution of the disease may be gathered from the foregoing account of the inception of the epidemic. The culpable disregard of the plain and urgent duty to promptly and efficiently isolate the primary cases, and the neglect of a populous town to keep in permanent readiness a hospital for infectious diseases, seemed but steps in beckoning on the Nemesis which in such cases hovers near. It needs no profound philosophy to make us believe that the entire absence of small-pox from the city for four or five years was not an unmixed blessing. Besides the municipal dereliction of duty, vaccination, both public and private, had come to be neglected, and thus much had been ordered which is needed in starting a small-pox epidemic.

There were also other circumstances which favored the rapid spread of the disease, when once it had a foothold. As is well known it was confined very largely to the French Canadian portion of the municipality and to their quarters of the city. Those of other nationalities suffered comparatively little. Of the 3,164 deaths from small-pox, there were among the

French Canadians	2,888
Other Catholics	180
Protestants	96

By some strange fatality of ignorance or of race, these French inhabitants were led to refuse vaccination and even to resist the salutary law which, late in the course of the epidemic, would offer protection to their children. Such a fatal error, in a superstitious people, was due largely to a few persons who, for a cheap and ignoble notoriety, would deny the value of what we have for nearly a hundred years been blessing the name of Jenner for giving us. There is not a chance, founded upon observed fact and rational argument, to deny the protective power of vaccination or its very great comparative safety when done by careful and intelligent physicians; yet there are those who, themselves usually sufficiently protected by vaccination, would, in the face of an epidemic of small-pox, withhold from the endangered multitude the only thing which can give immunity.

Next then, after the incompetent policy of the municipal authorities, we must put as a cause of the Montreal epidemic, the demagogism of charlatans. In these years while there had been no prevalence of small-pox and no vaccination, a younger generation had come up, or amongst this somewhat nomadic race, had immigrated to the city, bearing no talismanic scar to protect them from the great scourge. The adult population had largely, at some time in their lives, been vaccinated; they might have the small-pox, and many did, but the influence of an old vaccination was still sufficient in most of the cases to keep their names off the death list; therefore we find a remarkable preponderance of deaths among children and young people.

Of the 3,164 deaths, there were of those

Under 15 years of age,	2,856
" 10 " "	2,560
" 5 " "	1,683

Thus we have had carried on for us by the anti-vaccinationists an experiment on a gigantic scale, to show whether small-pox is still the same implacable foe to human life that it used to be. Such a cruel spectacle of the slaughter of the innocents they might have spared us, for it has been proved, time and again, that the virulence of small-pox has not deteriorated in the least, from the time when it was every year slaying its thousands in every civilized country of the world, except as it has been modified by vaccination. A case of small-pox now, in the unvaccinated, presents the same pathological aspect and follows the same dangerous course that it did five hundred years ago. As the oak tree now presents for the description of the modern botanist the same characteristics which it had centuries ago, so undoubtedly has the organized bacterium of small-pox, if it has such a cause, preserved unchanged, since the days of Jenner, its specific characteristics, and will for all time.

The moral of this epidemiological experience of a neighboring city is too obvious to need a formal presentation. Let each and every municipal authority remember it and heed it, that we may still cherish the old adage that "It is an ill wind that blows nobody any good."

Measures of Protection.

In the early part of September it became evident that the epidemic in Montreal was not controllable by the city authorities, and that there was no prospect that it would very speedily be subdued. The disease had already spread to the suburbs and to several other Canadian towns, and if we were to be spared a like unwelcome visitation it would need prompt action and continued vigilance. A system of inspection and quarantine at the points of entry along our northern border was an immediate and pressing need, and yet the appropriation at the disposal of the Board was altogether inadequate to the organization of such a service. In this dilemma we turned to the General Government for aid. An application for this purpose was made September 22, 1885, by the Board, under the approval of the Governor. Previous to this, an inspector had been put on the Grand Trunk Railway at Island Pond, Vt., and it was seen that thorough work, if done there, would obviate the necessity of an inspector at, or nearer, our State line.

On the evening of September 24, a letter was received from Skowhegan, calling the attention of the Board to the considerable travel down the Canada road, from Quebec and the surrounding country, into our own State. A visit to that town by early train next morning and a consultation with various persons in the place gave sufficient evidence that it would be a prudential step to send an inspector up to Moose River as soon as possible. At this time, though small-pox had invaded but few towns down the St. Lawrence, whence our Canada road draws it travel, yet it was extending in that direction and in the immediate future would endanger not only the manufacturing towns of the Kennebec, but would be likely to strike a serious blow to the lumbering interests by infecting the camps. That the latter danger was considerable and that it might entail a serious loss, not only to the lumber operators, but to the towns down the river depending upon the success of their industry, we may the more readily believe when we remember that in some parts of the West, notably in the lumbering regions of Michigan, Wisconsin and Minnesota, in past years the prevalence of small-pox in the camps has had a disastrous effect upon their winter's operations.

In "Public Health in Minnesota," for November, the official publication of the State Board of Health, the following mention is made of one of these epidemics.

"In 1883–4, what is known as the Lumbermen's Epidemic, the disease appearing in lumbering camps in the unsettled and unorganized district north of Aitkin and northwest of Duluth. Seventeen distinct outbreaks, of which eight were in temporary lumber camps. Two hundred and sixty cases and seventy-eight deaths. Though but fifty-eight cases occurred in the lumber camps, with seventeen deaths, the difficulty and expense of control was very great, not far from one hundred dollars for each case."

To call their attention to this danger and to induce them to guard against it, the following circular was sent to all the lumber operators in the State, as far as their names could be learned, not omitting those in New Brunswick who operated on the St. John waters:

To the Lumbermen of the State.

With the view of not only saving life as far as possible, but also deeming it a duty, when practicable, to consider the business interests of the State, the State Board of Health wishes to bring to lumbermen the following considerations:

In Canada there is a very unusual and fatal prevalence of small-pox. In Montreal there have been for some time from twenty-five to thirty deaths daily, and lately the number has ranged from forty to fifty. The number of cases of the disease which actually exists in the city it is hard to get at on account of the imperfections in the reports; but the number lately has been variously estimated at from 2,000 to 4,000. Outside of Montreal the disease has spread so that now many other towns and villages are affected. The result of this is that the business of the Province is depressed, and it seems inevitable that a much larger number of men than usual must leave their homes the coming winter to seek employment in other places. This will undoubtedly bring an unusual influx of these people into our own State for the purpose of working in the woods. In hiring these men there will be considerable danger of introducing small-pox into the camps. There will be not only the danger of having men who have been exposed to the disease come down with it after they arrive in camp, but the greater danger that the contagion of the disease (which may be preserved for months in clothing which has not been disinfected) may be communicated to those who have not been where the disease is. What the results of the introduction of small-pox into a camp would be it needs but little reflection to show. It would mean the speedy leaving of many of the men and the impossibility of getting other hands to take their places. This would mean the failure of the lumber operation for the season.

To obviate these dangers it is recommended that every operator require that no man shall be hired for the woods unless he has been recently vaccinated. It is not sufficient that the man has at some time or other been vaccinated, but it should be required that he has *recently* been vaccinated.

The lumber operators are in a position to do much in helping to protect the State from small-pox the coming winter, and for the purpose of guarding the well-being of the Commonwealth and at the same time looking after their own business interests, the Board would like suggestions from them in regard to the most practicable ways of securing vaccination of the men whom they hire. It is not wished to create any unnecessary apprehensions, but the danger which has been pointed out is real and considerable, and the only way of guarding against it is by the method which has been suggested.

By order of the State Board of Health.

A. G. YOUNG, *Secretary.*

AUGUSTA, September 29, 1885.

Very encouraging to the Board, as showing that its endeavors and suggestions were appreciated by practical business men, was the following, received a few days after sending out this circular:

GREENVILLE, MAINE, Oct. 3, 1885.

To the State Board of Health, Augusta, Maine:

Realizing the importance of the suggestions contained in your circular letter of the 29th ult., the undersigned, municipal officers of Greenville and lumbermen of this vicinity, would express their commendation of the methods therein set forth to prevent the introduction of small-pox into the State, through the employment of laboring men from the infected districts. Our location exposes us more than most other towns. We would suggest in connection with the methods named in your circular that a physician be employed to visit the several lumbering camps in this section at about the time the majority of them get to work and again two or three weeks later, vaccinating all employes not recently vaccinated, and that the lumbermen agree to dismiss any man refusing to be so vaccinated. We would ask your judgment as to the advisability of employing guards in accordance with Chapter 14, Section 4, of the Revised Statutes, during the time most of the crews are hired, say from October 15 to December 1.

LINDLEY H. FOLSOM,
LEONARD K. YOUNG,
MARK MCPHETERS,
} *Municipal Officers of Greenville.*

John H. Eveleth, Mark McPheters, T. A. Young, W. L. Rogers, J. E. Bigney, M. Cullen, M. G. Shaw & Sons, H. E. Drayton, J. Willis Ronco, D. T. Saunders, Harry A. Sauders, Levi Davis, John G. Sawyer.

In accordance with the recommendations of the Board made in another brief circular, which was sent to the lumbermen a few days later, an agreement was entered into by most of the operators in the State not to hire any men for the woods unless they had been vaccinated. Several of the larger operators distributed and posted up, over Maine and Canada, notices like the following:

NOTICE.

No men will be employed by this firm who have not been recently vaccinated, and cannot exhibit marks of vaccination, and no men from Canada will be allowed to visit or enter camps who come from places where the small-pox prevails and who have not been vaccinated.

LAWRENCE, PHILLIPS & CO.

AVIS.

Aucun homme n'ayant étè recemment vaccinè et n'en pouvant montrer les marques sera employè par cette compagnie. Personne venant des parties du Canada ou existe la picote ou n'ayant étè vaccinè pourra visiter ou entrer dans nos campes.

LAWRENCE, PHILLIPS & CIE.

At the same time with the Lumbermen's Circular the following was sent to the various manufacturing companies in the State:

To Manufacturers and Others.

To those who employ numbers of workers in any industrial enterprises it is of the greatest importance that the most effective measures be taken to guard against the introduction of small-pox. Let a few cases of this disease appear in a manufacturing center and the interference with the business of the place might be serious, and there would be a possibility that the results might be disastrous. If the disease should appear in the factories themselves there would be a stampede, more or less, of the operatives, and the difficulty of getting other hands to immediately take their places would be great. Goods that would be under the suspicion of carrying the poison of the disease would not find a ready sale. The measures which the municipal authorities might find it necessary to employ in preventing the spread of the disease might be inconvenient and burdensome to trade. Altogether, looking at this matter with only mercenary motives, it is much more economical to take measures to prevent the breaking out of a contagious disease in a place than it is to stamp it out after it is under headway.

The danger of the introduction of small-pox into our New England towns is at the present time very great, especially in the case of those towns which have much of a Canadian population, or which have much communication with Canada.

The epidemic in Montreal has reached alarming proportions. The municipal authorities have found it impossible to successfully cope with the disease, and, instead of seeing any signs of abatement, there has been a progressive increase of the death rate and of the number of cases of the disease. Outside the city the scourge is prevailing in many of the other towns and villages in the province.

In many of the towns in Maine there has been a serious neglect of vaccination, so that there is a large proportion of the population which is not protected from small-pox if it should be exposed to the contagion of the disease. Under such circumstances the introduction of the disease into a town or factory would be likely to give rise to much trouble.

This circular letter is addressed to the manufacturers of the State for the purpose of laying before them the danger as it is, and of urging them to co-operate with the local health authorities in order to secure as full and complete a vaccination of the inhabitants as possible, and especially of all operatives in mills and factories with their families. The owners of such factories are in a position to confer a public benefit, as well as to protect their own business, by requiring that all operatives employed by them shall be vaccinated. It is not enough that they have been vaccinated, but it should be required that they be *recently* vaccinated or re-vaccinated. In no other way can there be a reasonable expectation of security.

By direction of the State Board of Health.

A. G. YOUNG, *Secretary*.

AUGUSTA, September 30, 1885.

Circular letters were also sent to the municipal officers of all the towns, warning them of the danger and urging that immediate steps be taken to avert it by vaccination, and by prompt action if cases of small-pox should occur in their respective jurisdictions, or if suspected cases should be found.

Besides this correspondence, personal visits were made by members of the Board to towns in which there seemed to be the greatest danger, for the purpose of urging immediate preventive measures, especially in towns which are manufacturing centers and have large French-Canadian populations. In almost every case the towns acted upon the suggestions of the Board with commendable promptness, and though the vaccination in most of the towns has been far from universal, it placed them in a position, especially at the more vulnerable points in the State, to more safely meet the danger of an adventitious introduction of a case of small-pox.

It was not long before considerable of the burden of solicitude was lifted off the Board by the knowledge that the towns were awake in the matter, and by the confidence which came to us that the first stray cases which might make their appearance would be likely to be promptly taken care of. That these expectations of prompt coöperation on the part of local authorities were not to be disappointed the first case of small-pox reported to the Board assured us. On Oct. 5, from the attending physician came the following telegram:

BRUNSWICK, MAINE.

To A. G. YOUNG, M. D., Secretary State Board of Health:

A case of probable small-pox has appeared at West Harpswell.

G. A. HARLOW.

A telegram to the Hon. S. J. Young, member of the Board at Brunswick, brought further particulars. The case proved one of confluent small-pox and terminated fatally on the eighth day. Dr. Harlow contributes the history of the case:

As regards the case of small-pox, Mr. Webber came to Montreal in a vessel the first of September. Was on shore several times up to the 21st, when he left the vessel in the morning and was in the city all day. He told a friend in Portland that he saw a few cases of small-pox. He arrived in Harpswell by way of Portland the 23d, was here nearly a week and then went to Portland. Was taken vomiting the morning of Oct. 2, and came to Harpswell on the afternoon boat. I was called Saturday the 3d, and found him with pulse 90, temperature 101 degrees, flushed face, slight headache, some nausea and *no backache*. He claimed he had a good appetite but did not dare to eat. I have good reason for believing that he wilfully denied all symptoms that he thought pertained to small-pox He had never been vaccinated and I immediately made four insertions. I was misled by his statements and did not advise quarantine until the eve of

October 4, but I could get no one to do anything until the next noon, when I got permission to quarantine him in the house where he was. The rash began to appear that morning (Oct. 5) on his forehead and by night was thickly spattered over his face and some on his arms and breast. It proved to be of the confluent type. At the time of his death there was not a spot on his entire body that was not covered with scabs, and the nurse said he began to turn black twelve hours before he died (Oct. 11).

The family lived in a room in the house the most remote from the sick-room with two vacant rooms between. Vaccination for the family and the town generally was pretty thoroughly done and no secondary cases arose.

Oct. 24, the City Physician of Portland sent the following telegram:

Dr. A. G. Young:

Case of variola this P. M. House quarantined. Patient at pest-house.

C. D. SMITH.

The history of this case, kindly sent by Dr. Smith, is this:

J....D....K...., American, age 24 years, was first seen on the afternoon of October 24, 1885, by Dr. William Gammett and myself, at the Cumberland House, on Green Street. The face, neck, and forehead were thickly covered with a papular and vesicular eruption. The forehead and face were of a bright scarlet color, and swollen to a marked degree. The eyelids were puffy and the conjunctivæ injected, as was also the mucous lining of the mouth and pharynx. The vesicles on the neck were of an average diameter of an eighth of an inch; though there were many of larger size. A number on the neck, the arms near the shoulder, and on the back were deeply umbilicated and filled with a milky fluid.

The patient states that on the 5th day of October he was vaccinated but there was no sign of any "take" until the 17th, and then the arm was not very sore. He now has a vaccination crust on the left arm. There is no eruption near or about the point of vaccination. He states that he first became aware of the eruption on the morning of the 23d, it having made its appearance during the night of the 22d; he said it felt "as though the skin was covered with fine hard pimples, and there was a great deal of itching."

Has had no special feeling of discomfort, no head or back ache, and said that *then* he felt first rate. The thermometer, however, registered 102.5, and the pulse indicated 120. A diagnosis was made of varioloid modified by co-existing vaccination. He was at once removed to the pest-house, and the Cumberland House and its inmates were quarantined.

On the next afternoon I saw him again, and found on the arms, fore-arms and wrists an abundant crop of papules and a few vesicles. A few vesicles on the neck and on the forehead, along the margin of the hair, had become pustular. The temperature continued at 102.5. On the fifth day after the appearance of the eruption a thick crop of papules began to appear on the thighs and legs, while those on the forearms, hands and wrists were evidently aborting; a few, however, going on, aborted at the vesicular stage, while here and there were some fully-formed pustules. On the seventh day after the appearance of the eruption there were a few vesicles on the thighs, but most of the eruption on the lower extremities aborted in the papular stage. Up to Friday, November 13, improvement was uninterrupted; and after a thorough cleansing in an alcohol bath and being fumigated, the patient was provided with an outfit of new clothing and discharged.

This case seemed to me of perhaps some interest, as illustrating the influence of vaccination in modifying the course of varioloid, which at the outset promised to be well-marked. From the appearance of the patient's face on the night of October 24, one would have expected a case of confluent variola; but the whole progress of the disease was exceedingly mild.

The Cumberland House was thoroughly fumigated with sulphurous acid gas and the walls disinfected, as well as the floors and ceilings, with hot solution of mercuric bichloride. No other cases followed, and the patient has never been able to remember any possible exposure to contagion.

Early in May, near the time when the Board entered upon its duties, a case of small-pox occurred in Lewiston. Dr. Martel, the City Physician, sends the following facts regarding the case:

On May 19, I was called to see a little girl, five years old, on Lincoln Street, who, with her family, had recently been on a visit to Canada, near St. Hyacinthe, where at that time there was no small-pox. The family had returned from Canada on May 1st. Writing to St. Hyacinthe, I learned that, on that same day, a girl convalescent from small-pox had come from Montreal to St. Hyacinthe in the cars. They probably took the same seat.

The girl had been sick several days. I sent the whole family to the pest-house on the day of my first visit. The parents had been vaccinated, and I vaccinated the other two children immediately. The case proved to be confluent small-pox, and proved fatal on the 24th. The family remained at the pest-house six weeks. No other cases followed.

L. J. MARTEL.

These three cases of small-pox and of varioloid are all that have appeared in our State during the year of 1885, unless one other very light and doubtful case should be called varioloid.

The Inspection Service.

In accordance with authority given to the Secretary of the Board by Dr. J. B. Hamilton, Surgeon General, U. S. Marine Hospital Service, Washington, to make nominations of sanitary inspectors to protect the various routes through which small-pox would be likely to enter our State, nominations to these positions have been telegraphed from time to time as circumstances have demanded.

This authorization was conferred Sept. 30, and the Board thought themselves fortunate in securing for the Moose River station the services of Dr. J. B. Thornton, who was ordered there at once.

In company with Dr. Watson, Secretary of the State Board of Health of New Hampshire, I went to Island Pond Oct. 8th. The object of our visit was to satisfy ourselves whether the work of inspection there was sufficient to afford protection to our respective states. We found that the one inspector, Dr. Pottle, who was stationed there, had more work than he could do well.

I offered to send a man from our State as an assistant inspector to aid him, and immediately telegraphed to Dr. Horr, of Lewiston, member of the Board, to find such a one. It was, however, two days in spite of free use of the telegraph before we found a man, and a still longer annoying delay followed before he had orders from Washington to proceed to Island Pond.

At Island Pond, besides the insufficient help, we found the arrangements very far from satisfactory. Arrangements were made with the inspector on duty to begin immediately a system of thorough disinfection for baggage and goods, and soon after there was introduced into the service a very simple and ingenious system of checks or passes for examined passengers, which Dr. Watson had put in use in the local inspection service in his own State.

In the latter part of October, from information received in the office, it seemed that there might be need of an inspector near the terminus of the International Railway near Lake Megantic. Accordingly I went to Sherbrooke, on the Grand Trunk, the point of departure for the International Railway, and was fortunate to there meet Mr. Weston, Deputy Collector at Lowell Town (Megantic). From information derived from him, it was evident that an inspector was needed at that point. I therefore telegraphed from Sherbrooke to Washington the nomination of Dr. J. F. Hill, of Waterville.

His nomination was confirmed, and he was ordered to Lowell Town.

In September it became evident that with the extension of small-pox down the river St. Lawrence there would be considerable danger of having the disease introduced into the Madawaska settlements. In the early part of November I went to Madawaska. It was seen that it would be futile to place an inspector there on our side of the river, and as soon as possible I went to Fredericton and St. John to confer with the Provincial Government. The following letter to the Surgeon General is self-explanatory:

STATE BOARD OF HEALTH,
AUGUSTA, MAINE, Nov. 16, 1885.

DR. J. B. HAMILTON,
Surgeon General,
Washington, D. C.

Dear Sir:—I write this as I promised in my dispatch from Vanceboro, to explain the circumstances which have made it necessary for me to seek the co-operation of the Government of the Province of New Brunswick for the purpose of protecting the north-eastern part of our State from the introduction of small-pox. A reference to the Weekly Bulletin of infected Canadian towns and the map which I send you will show that the disease has been spread widely from Montreal, especially to the towns down the St. Lawrence River. With the extension of the disease in this direction, the above-mentioned part of our State has become seriously threatened. You will notice that there are reported in the Bulletin 50 cases at Cap St. Ignace, 8 at Riviere du Loup; and even as low down as Rimouski, 8 cases.

From Riviere du Loup to Edmundston, the present terminus of the New Brunswick Railway, it is 79 miles. This is the only road from the St. Lawrence region to the upper St. John country. Between these two points there is a nightly mail coach running both ways, and much travel on foot and by teams.

From Grand Falls, near where the St. John River begins to form the boundary between Maine and New Brunswick, upward for 75 miles is what is known as the Madawaska region. It is very thickly settled all the way on both sides of the river. On our own side of the river there are about 15,000 of this French population and probably as many more on the New Brunswick side. This Madawaska French population is almost entirely unvaccinated, and if small-pox should get among them it would undoubtedly be attended by a great mortality, and would be sure to be spread extensively southward by the lines of travel in this State and New Brunswick. Here, on our own territory, there is no place where an inspector can control the travel on this Canada road. From Edmundston to the Canada line it is 12 miles, and at one point near the line there is a place in the hills where all travel from Canada must pass.

I have proposed to the Government of New Brunswick to post inspectors at this point and I thought our Government would pay one-half the expenses. My proposition is to station a man there from our State and one from New Brunswick and have them work under the authority of the New Brunswick Government. My telegram from Vanceboro was sent to enquire whether I may be authorized to make this offer in your behalf.

Yours respectfully,

A. G. YOUNG,

Secretary State Board of Health.

Augusta, Maine.

As a result of this visit and the representations made to the Attorney General of New Brunswick, arrangements were made for the establishing of an inspection service between Edmundston and the Canada line, which was soon done.

Near the middle of November it was learned that there had occurred a sudden outbreak of small-pox at Charlottetown, Prince Edward Island. It seems that the first cases were called by the name of that miserable little exanthem of childhood, chicken-pox, whose most dangerous attribute is that it so frequently gets confounded wiih small-pox. Many persons were exposed before the true nature of the disease was known; hence there resulted quite an extensive outbreak of the disease.

On the 19th of November a letter was received from the Hon. Lewis Barker, of Bangor, member of the Board, and also in the same mail, one from the Hon. E. B. Neally, Mayor of that city, saying that the people from Prince Edward Island were coming through, by way of the New Brunswick and Maine Central railroads, in quite large numbers. Getting these letters too late to take the morning train, I spent the time intervening before the afternoon train in making arrangements for putting into immediate operation a system of inspection at Vanceboro. Arriving in Bangor, I was met by the Mayor and we made arrangements for a local inspection service to take charge of each train coming from the east. In the morning, telephoning early to the police station for a policeman to meet me at the upper station, we took the incoming St. John train and held the second-class passengers until those from the infected island, eight or ten in number, were vaccinated. On the train at the same hour coming from the west, Dr. G. H. Brickett, of Augusta, came according to arrangements of the day before, and we proceeded to Vanceboro. Dr. Brickett kept this train to Harvey, where he took the next incoming train from St. John. Since then every train has been caught and inspected.

While at Vanceboro, in answer to a telegram to Mr. Tucker, General Manager of M. C. R. R., he ordered his men to immediately put up a fumigating station for us, and by means of this kindly aid we were ready in twenty-four hours to disinfect all suspected baggage or goods. Dr. M. L. Young, of Vanceboro, was also appointed inspector at that place with Dr. Brickett. At the end of a week the Board was sorry that circumstances made it necessary for Dr. Brickett to tender his resignation. From this time C. W. Harlow, of Auburn, has been filling the place thus made vacant.

The outbreak of small-pox in Charlottetown resulted in 124 cases and 52 deaths within the limits of the city, besides its extension to quite a number of other towns, mostly on Prince Edward Island. St. John, N. B., enforced a very thorough system of compulsory vaccination and escaped without a case.

VACCINATION OF RAILROAD MEN.

During the epidemic prevalence of small-pox it is quite important, as respects the safety of the State, that all persons in the employ of the railroads, especially all train hands, should be protected by vaccination. This is shown by the histories of the two cases in Montreal, which introduced the disease into that city. When we suggested to Mr. Tucker, General Manager M. C. R. R., and to Mr. Hickson, General Manger Grand Trunk Railway, the advisability of vaccinating the employes of their respective roads, our proposal met their hearty approbation as a measure in the interest of both the public safety and of their own business. They therefore immediately offered us every facility for vaccinating the men and used their influence to have the vaccination as general as possible. The Secretary, therefore, began at once the work of personally vaccinating the men, first on the Grand Trunk from Portland to the State line, and then on the Maine Central from Portland to Bangor and from Lewiston to Bath. Later the train hands running to Vanceboro on both the Maine Central and New Brunswick roads were vaccinated by the Sanitary Inspectors at the request of the Secretary.

As it is wished to admit into this report only what may interest the people or be of some use to them, descriptions of most of the journeyings to various places on business of the Board, as well as the great mass of the diurnal correspondence, is omitted.

Some of these longer journeys not already spoken of may be barely mentioned. To Moose River by stage from Skowhegan; to Montreal; to Vanceboro and Calais; a second visit to St. John, thence to Eastport and Portland in the boat.

Expenses of the Board.

The amount and character of the expenditures of the Board for 1885 have been as follows:

Engraving and drawing	$ 4 50
Books and sanitary journals	274 99
Instruments	181 35
Paper and stationery	272 45
Postage	233 10
Printing and binding	293 80
Secretary's salary	1,250 00
Expenses of members	168 47
Express and telegraph	54 03
Expenses of Secretary	118 56
Clerical help	56 25
Miscellaneous (Vaccine Virus)	92 12
Total	$2,999 62

VARIOUS SANITARY TOPICS.

Soon after the Board began its work a circular letter of enquiries was sent out to all the physicians in the State, comprising the following series of questions:

TOPOGRAPHY.

Please give the topographical characteristics of your town, including, as far as you can:

1. Altitude.
2. Temperature records.
3. Nature of soil.
4. Geological formation.
5. Relative acreage of hill, flat and swamp land.
6. Is there much stagnant water?

EPIDEMIOLOGICAL RECORD.

7. What are the prevailing diseases in your town?
8. Have you noticed any peculiarities in the diseases in your neighborhood? If so, what?
9. Please give the history, as far as you can, of scarlet fever, diphtheria, and of typhoid fever, in your part of the State, especially of the epidemic prevalence of these diseases.
10. Please give any facts regarding the prevalence of any other diseases as endemics or epidemics.
11. How many times has small-pox invaded your town?
12. Please give as much information as you can in regard to the origin of the infection and the probable cost to the town, when small-pox has appeared.
13. What portion of the inhabitants has been successfully vaccinated?
14. Please communicate anything you know of the existence of cholera or yellow fever in this State in past years.

SCARLET FEVER.

15. Have you observed any notable cases of scarlet fever in which the contagion was pretty certainly communicated by means of clothing or other fomites? If so, please give particulars.

16. Have you known of cases in which the contagion seemed to retain its vitality long in clothing or in rooms?
17. Have you known of the disease having been spread by public funerals?
18. What part, in your estimation, do unsanitary conditions play in the causation of scarlet fever?
19. What proportion of your cases do you think were due to infection derived directly or indirectly from other cases?
20. Please give any unusual or interesting cases which have come under your observation.

DIPHTHERIA.

21. Has diphtheria been prevalent in the place where you are?
22. What, in your opinion, have been the more frequent causes of the disease?
23. Please give any cases coming under your own observation, which are good illustrations of the danger from the contagion of the disease, or of the causation of the disease by unhealthy conditions.
24. What has been your observation regarding the spread of the disease through schools?
25. Have you observed that the disease has spread by public funerals? If so, please give full particulars.

TYPHOID FEVER.

26. Have you noticed cases which seemed to be caused by the pollution of water by cess-pools, sink drains, privy vaults, barn-yards, or other decomposing animal or vegetable matter?
27. Have homes or localities come under your observation where typhoid fever has recurred in successive seasons? If so, have you thought the recurrence might have been caused by the infection of privy vaults or the surroundings of the dwellings with the discharges from former patients? Or has any other explanation suggested itself to you?
28. Please give any interesting cases in your practice, which seemed to be due to unsanitary conditions.
29. Please give pen sketches to illustrate positions of well, privy, dwelling-houses, etc., when necessary.

PHTHISIS.

30. Are cases of pulmonary phthisis very frequent in your part of the State?
31. In your opinion, what are the more frequent causes of this disease?
32. What part in the causation of this disease is due to imperfect ventilation? What to dampness?
33. Do you think that the bad ventilation of school-houses has much to do with causing the consumption of later years?
34. Have you known of any cases which were pretty surely caused by unsanitary conditions? If so, please give particulars.

35. Please give any cases which seem to illustrate the hereditary tendency of this disease.
36. Please communicate any observations which seem to show the infectiousness of phthisis.

SCHOOLS.

37. What are the most common faults in the school-houses in your town?
38. Please give any cases which you have observed of illness or of disease of scholars or teachers coming from faulty ventilation, heating, lighting, or any other unsanitary condition in connection with the school-houses.
39. What percentage of pupils is absent on account of sickness?
40. Is headache a frequent complaint?
41. What precautions would be enforced, if a case of scarlet fever or diphtheria were found in the school-room.
42. Have any particular school-houses been noted for unhealthfulness? If so, please state particulars fully.
43. Have you known of cases of serious disease or of death of teachers resulting apparently from overwork or unhealthy conditions of the school-room? If so, give particulars.

In answer to these enquiries we have received communications from a large number of physicians in the State, as will be seen on other pages, and these reports from our medical correspondents contain much of very great value. Besides this generous contribution of information was the almost invariable accompaniment of words expressive of sympathy with the purposes of the Board and of appreciation of the importance of the work which has been begun.

Much of the information thus collected is not embodied in this present Report, but it is hoped to utilize other portions of it in the future. The whole of the matter received on "Topography" in its bearings on sanitation or its opposite condition, has been omitted in this Report for want of space. The same is true of much interesting matter pertaining to an investigation lately begun into the history and causes of diphtheria in this State. Under "Epidemiological Record" and the questions following, it was wished to bring out as much as possible, not only of information regarding the present, but in a certain degree to make this first volume of our Report a record of the past of our State, in as far as concerns its epidemiological history. Many facts have been collected in this direction which are not only interesting but of practical value, since the wisdom of the future is drawn largely from our knowledge of the errors of the past.

In this report will be found, from some of the older members of the medical profession, interesting accounts of the prevalence of

CHOLERA IN MAINE.

In 1849 this disease appeared in Bangor and there resulted 320 cases of decided cholera and many cases of the disease in its incipient or incomplete form. Dr. S. B. Morrison, who was at that time City Physician, sends a very interesting account of the epidemic. In 1854 this disease appeared in Richmond, and the history of the epidemic, which destroyed forty lives, is given by Dr. Libby. In the reports from our correspondents there will also be found mention of the appearance of cholera in Bath, Biddeford, Castine, Damariscotta and Lewiston.

Another exotic disease which has a few times touched our shores is

YELLOW FEVER.

This is mentioned by our correspondents as having occurred in Bath, Damariscotta, Parsonsfield, York and Kittery.

In cholera and yellow fever we have examples of diseases whose habitat pertains to more tropical lands. Their extension through the avenues of commerce and travel from their homes to more northern climes now and then startles a world, and well it may, for in the new soil to which they may be transplanted we have learned that when they find the filth and other conditions congenial to them they are still capable of a frightful temporary mortality. With

SCARLET FEVER AND DIPHTHERIA,

however, we have to deal with foes which always lurk in our midst ready to seize especially the susceptible younger portions of our communities, and to avenge any delinquencies in our observance of sanitary requirements. The deaths annually so caused very largely exceed the numbers which fall from exceptional pestilences, and yet these large numbers cause not a tithe of the public solicitude and alarm which a very few cases of cholera or yellow fever or small-pox in our State are sure to create. Why this trepidation at the approach of the alien foe and our comparative unconcern in the frequent presence of the domestic enemy? The cause is largely no doubt to be sought in an acquired familiarity with scarlet fever and diphtheria, and in the impression that the present high rate of mortality from these diseases belongs to the inevitable order of things. Nothing, however, could be farther from the truth than this latter impression. An all-wise and beneficent Contriver has established that we shall not pluck the glowing coal and escape the smart; that we shall not eat of the poisonous fruit and go unharmed. And just as imperative is the command that we shall breathe pure air, eat and drink good food and pure water, and keep ourselves and our children aloof from those sources and causes of contagious and infectious diseases, or suffer the penalty of disobedience. Along with the perception of this divine plan there should go the cognition of the cheering fact that those diseases which in our Commonwealth play the greater part in swelling our death rates, are just those diseases which are the most easily controllable by sanitary precautions. A very large part of our mortality comes from consumption, typhoid fever, diphtheria, scarlet fever and similar zymotic diseases, and it is known that these diseases are in a large measure preventable.

The answers from our medical correspondents show, as was to be expected, a unanimity in regard to the question of infectiousness of

SCARLET FEVER.

The public generally need not to be told that this disease is communicable, but in regard to some of the characteristics of the infection there is need of instruction. The general conviction of physicians is that scarlet fever is "due to infection derived directly or indirectly from other cases" of the same disease. A combination of unsanitary conditions is often thought to give rise to various other diseases, but these are thought to not be sufficient to produce this. A something else is required, and this something else is the specific infection of this disease. To acquire this, it is not necessary to go into the presence of the disease; it may be brought to us in the clothing or other effects of those who have been where it is. It would seem that a very small quantity of this specific cause is sometimes sufficient to produce the disease,—even what may adhere to the surface of a letter may suffice. Several interesting cases of this kind are given from Sidney, Livermore Falls and New Gloucester.

Our correspondents give testimony also which shows that this scarlet fever contagion may retain its vitality for some time in clothing or other articles. Half a dozen or more narrate cases in which the infection was preserved in an active form for from six months to a year; one (No. Waterford) gives a case in which three years had elapsed; one (Boothbay), four years; two (Bar Harbor and Madison), five years; and one (Cherryfield) a case in which scarlet fever was said to have been contracted from an old shawl after a period of seven years. Such long periods as these latter may give rise to suggestions of doubt in regard to the correctness of the conclusions, yet the fact is well established that the contagion of this disease may be preserved for a considerable time. If for one year, why not longer? If the vitality of grains of wheat has been preserved thousands of years in Egyptian sarcophagi, why may not the life of disease germs be retained five or seven years in a barrel of rags? It will be noticed that in these cases of long-retained infection the articles have usually been packed away and left undisturbed. Several times an old shawl has borne the fatal infection for months or years; twice it was set free from rags when the unfortunate rug-making impulse seized the household; once it was a doll which little hands stricken with the fatal infectious malady had fondled in their last hours.

The account of the epidemic of scarlet fever in Freeport is instructive as showing some of the ways in which this disease may be distributed through schools and communities.

DIPHTHERIA.

Regarding the causation of diphtheria we do not find the same concordance as in the case of scarlet fever. There is considerable diversity of opinion in regard to the contagiousness of the disease, and some even hold to the belief that the disease is incapable of spreading by contagion or infection. This is a most dangerous teaching in a sanitary point of view, and too often, in the presence of the initial case of the disease, has been a disastrous one for a family or a community. The writer must acknowledge that in earlier years he possessed the belief that diphtheria is a disease only very mildly contagious; that is, that there is but little danger of its spreading by contagion or infection; but a succession of cases offered positive testimony of a kind that could not be overlooked or gainsaid. While claiming emphatically that diphtheria is a contagious disease, and holding to the view that its origin is usually due to contagion, it is but fair to admit that the history of the origin of many cases and of many epidemics offers considerable negative testimony against these assumptions. Yet the whole mass of this negative testimony and negative experience must remain invalidated in the presence of such proof as the following cases give that diphtheria *is dangerously* contagious:

> In 1881 there had been no diphtheria in my neighborhood for nearly four years. The school teacher, during the summer vacation, went to the city, a notorious hot-bed of diphtheria. While there he contracted what he called a slight sore throat. He returned with this still upon him and opened school. In less than a week there were six lying sick with diphtheria and the school was closed. As the children spread the disease in their several families it resulted in five deaths, three of which were adults.
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> In April, 1881, a boy ten or twelve years of age, who had had diphtheria in Boston, came here to visit some relatives. He went first to stay with his aunt. On Friday of the week in which he came she washed some of his clothing. The next week she was taken with diphtheria and it went through the family, four cases. Before the aunt was taken sick the boy went to an uncle's where he played with another boy about his own age. This boy also had diphtheria, and there were three cases in that family. Other cases of contagion were just as well marked.

Many other cases quite as convincing as these may be found through the reports from our correspondents. Particularly instructive are those given by Dr. Hall, of Monson, and Dr. Giddings, of Gardiner, and the history of the epidemic in Bar Harbor, which is sent by Dr. Moore.

Of the two cases which have been transcribed above in proof of the contagiousness of diphtheria, the first shows how, from a case of "slight sore throat," a wide-spread and severe outbreak of genuine diphtheria may arise; in the other is illustrated the fact that diphtheria patients are dangerous to the community for some time after recovery if allowed to run about without any consideration for the safety or the rights of others. This danger comes from two sources: First, from the fact that the recovery is frequently only an apparent recovery. In the throat or in the naso-pharyngeal cavities there still persists a trace of the original disease; it may be evidenced by a slight nasal discharge or by a diminutive spot of the characteristic false membrane. Such a patch of the diphtheritic membrane the size of a split bean the writer has seen adhere firmly to the pharynx for ten days after apparent recovery. Such cases as these, and also cases of "simple sore throat," many of which are in reality cases of mild diphtheria, are doubly dangerous for the reason that while they bear the infective capabilities their true nature is often overlooked.

The second source of danger in those lately recovered from diphtheria is that of carrying the disease in their clothing. There is evidence enough to show that this disease is altogether too readily thus conveyed for the safety of many communities with their present uncertain convictions and lax practices in the management of cases of this kind. As the result of such, woe has befallen many a family, as it did in the following unfortunate instance from Bar Harbor:

> I was attending a family whose children were all sick with diphtheria (three in number). All died from croupous form. The nurse believed it was not possible to carry the disease in clothing and said she would not change her dress upon leaving the house. She was not afraid to take her children in her lap upon going home. She was admonished against such a foolhardy course. She told the neighbors a week after being home that she did not change her clothing after coming from the infected house, "And," said she, "my children have not got the disease." Ten days after leaving the infected house I was called to attend her family with diphtheria of the most fatal form I ever saw. One child died in thirty-six hours after it was attacked. These were the only cases that occurred anywhere in the neighborhood of the nurse's home. It is needless to remark, that nurse now believes it is *very* contagious.

The consideration of the questions relative to the communicability of scarlet fever and diphtheria raises naturally here the further inquiry,

WHAT IS CONTAGION? *

A long time before positive experimentation had begun to elucidate this subject the acute observation and the profound reasoning of the earlier physicians had led many of them to give an answer remarkably like that which the results of modern investigation give. In the presence of a case of infection from small-pox or scarlet fever or other infectious disease, they had observed, as we do, that no perceptible immediate results followed the reception of the contagion. Before the symptoms of the disease were ushered in there was a period of quiescence. This period was aptly termed the period of incubation. It seemed as though the presumably small quantum of the infective material, which had been taken into the system, had been silently increasing itself,—incubating, hatching, as the technical term would suggest—until its quantity in the system is sufficient to produce the disturbance which we call the disease. This train of reasoning still farther continued would throw more probable light on the nature of infection. The consideration of the fact that poisons of any kind, whether of inorganic, vegetable or animal origin, when introduced into the system produce their effects at once, or at least very soon after their absorption into the circulation, suggests a wide difference between the action of such poisons and the action of the contagia. It is not therefore a strictly correct use of words, nor one which helps to acquire an idea of their essential nature, to call these contagions "poisons." "Malaria" and "miasma" are terms which record one phase of thought which would ascribe to certain of the infections an aerial or gaseous nature. The persistent clinging of contagion to substances or surfaces is altogether inconsistent with the law of the diffusion of gases. If the contagious principle were a poisonous gas it would rapidly be diffused into space and quickly lose its power to harm.

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* See Glossary.

Accepting then the view, which an observation of the sequence of events in any of the infectious diseases would almost invariably compel us to take, that the original minute, often it must be infinitesimal, quantity of infectious material which is received into the system has been multiplying itself during the period of incubation before it is capable of producing the disease, we are forced back as a logical conclusion to the ancient theory of a "contagium vivum," for only organized bodies are endowed with the possibilities of self-multiplication.

In accepting this theory of contagion we do not take it in its old guise, as a structure based upon no other foundation than that of deductive reasoning. Over the older medical observers and thinkers, when the theory of a living germ of disease was first formulated, we have the very great advantage of scientific helps and more accurate methods than were known to them.

GERM THEORY.

The history of the gradual building up of the "germ theory" of disease is too long a story to find a place here, but as right ideas and settled convictions regarding the causes of diseases, and especially regarding the nature of infection, are essential to a correct and safe public and private policy in the management of the contagious diseases, the ætiological history of a single disease will be briefly given.

Anthrax, Charbon, or Malignant Pustule is a disease with a very ancient history. Among the domestic animals, especially among sheep and cattle, it has, both in the older and later times, caused terrible destructions of the flocks and herds, in some regions thousands dying annually from this epizoötic malady. This disease is also communicable to man, and in some countries large numbers of persons have lost their lives from eating of the flesh of anthrax-infected animals, or through other methods of infection. As early as 1849 it was discovered microscopically that the blood of animals killed by anthrax contained peculiar staff-like bodies. Later it was learned that these rod-shaped bacteria were present in the diseased organism some time before the death of the animal; and as they were so almost invariably found, they came to be looked upon as of some diagnostic value.

These bacteria, or "disease-germs", as we have since learned to call them, vary in length from $\frac{1}{25,000}$ inch to $\frac{1}{1250}$ inch. Later studies of these little bodies have taught that they are unicellular plants closely allied to the algæ, but devoid of chlorophyl, or germ coloring matter. When the conditions for their growth are favorable they multiply rapidly by fission, that is, one cell elongates somewhat and is divided by a central constriction, into two; the two likewise into four, and so on in this geometrical progression until, within a comparatively brief time, we have millions as the progeny of a single cell. The number of bacteria in a single drop of blood has been estimated at from eight to ten millions.

This power of rapid self-multiplication makes it necessary for the purpose of infecting a healthy animal to introduce but a minute quantity of the infected blood or other fluids into its system,—a single bacterium introduced on the point of a needle would, undoubtedly, often be sufficient to start the fatal diseased process.

Besides this multiplication by fission, the anthrax bacillus has another method of self-perpetuation and increase. Microscopical observation has shown that, at certain stages of their growth, the bacillus cells become granular and within them are formed spores which are set free by the rupture of the parent cells. These spores are of extreme minuteness and are characterized for remarkable tenacity of life. They may be dried, and desiccation prolonged for years does not affect their powers of germination when at last they find the proper conditions. Freezing does not harm them, and a degree of heat much higher than is needed to kill the parent bacillus cell is not injurious to them;—nothing in this direction short of prolonged boiling is sure of destroying them.

These spores when introduced into new fields of growth, for example, into a healthy organism, rapidly elongate and become bacillus rods like the cells which generated them.

These bacilli, quite early in these investigations, were affirmed to be the specific cause of anthrax. Although they were almost always present in this disease, and blood containing them was invariably found to be infective when inoculated into animals of species susceptible to this disease, yet the conservative spirit of modern science was not ready to accept them as the specific cause without farther question. Many scientists maintained that these bacilli were only concomitant phenomena, that they had no part in the causation of the disease,—that the disease made the animal fluids a favorable soil for their growth; therefore they took advantage of the favoring opportunities and grew.

It was found that these bacilli were capable of growth outside the animal organism,—that if transferred to various animal broths or vegetable decoctions and kept at a proper temperature, they still continued to multiply, and experimentation discovered that if some of these artificially-cultivated bacilli were injected into a rabbit or other animal, still the same infectious anthracoid disease was produced. These "cultures" were made as follows: A portion of mutton or other bouillon freed from other accidental atmospheric germs by boiling, was infected by dipping a needle into the anthrax infected blood and then carrying it to the bouillon. After some days, when the flask containing this was found to be swarming with the bacilli, a minute quantity from this flask was carried in a similar way to flask No. 2, and so on until the cultures were carried as high as the one-hundredth; and still, as many removes as this, the one-hundredth generation was found to have lost none of the original virulence of the infection which was possessed by the original anthrax blood. Animals could still be infected with these pure cultures and the same deadly disease carried from them to other animals.

Even at this stage of experimentation the objection was still maintained that these microscopical organisms are not the cause of the disease, and that in these cultures the cause was to be sought in a hypothetical ferment which had been transmitted from flask to flask with the bacilli.

To meet this last logical objection, Dr. Koch, of Berlin, opportunely discovered a method of cultivating these bacilli in the dry way on microscopic slides so that their various stages of growth could be observed under the eye and the presence of any accidental intrusion of other organism be quickly detected. These pure "dry cultures" have been carried to the one hundred and fifteenth, and still inoculations with a minute trace of the bacilli so cultivated invariably results in the characteristic anthrax disease.

This life history of the anthrax bacillus gradually worked out by the patient investigations of many microscopists it has been sought to apply to all infective diseases for the purpose of solving the mystery of their causation and the nature of their infection. As yet concerning many diseases we are surrounded by doubt, but it may be said that similar methods of investigation applied to others enable us to say as confidently as in the case of anthrax that they are due to microscopic germs. Taking the view that the demonstration of bacteria in the blood and tissues of a diseased organism is not a sufficient proof of their causal relationship to the disease, but requiring that these microbes shall be found capable of transmitting the affection when artificially carried to test-animals, and not contented with this even, but demanding further that the disease shall be transmitted by means of the pure cultures of these bacteria, we may say that the infection of anthrax, chicken cholera, septicæmia, pyæmia, gangrene, erysipelas, tuberculosis, leprosy and relapsing fever has been proved to be due to the presence of disease-germs.

Many things make the identification of the bacteria in many diseases presumably so caused and the demonstration that they *are* the essential cause a work of exceeding difficulty. Two of the most serious obstacles to advancement in these directions are the extreme minuteness of many of these bacteria, and especially of their spores, and the fact that many of the diseases afflicting mankind are with great difficulty, or not at all, inoculable on animals.

So much at least of the germ theory of disease as has been given, seems absolutely necessary to any understanding of the present condition of medical thought as regards the causation of contagious or infectious diseases, and the consideration of the movements of epidemics and endemics.

Coming back now to a further consideration of some of the questions submitted to our medical correspondents, we shall find ourselves in a position the more intelligently to do this.

DIPHTHERIA—(Further consideration of.)

Cases have already been cited, of a kind which it would seem ought to be sufficient to prove the mere fact of contagiousness or infectiousness of diphtheria; but from much that has been said and written about this disease one would think that it is not borne in mind that the admission that a disease can be spread by direct contagion does not preclude the possibility of its origin in other ways. In anthrax, whose bacterial history we have been tracing, there is pretty satisfactory evidence to show that the disease may have a tellural origin. The observation that the anthrax bacillus can be cultivated in the artificial way in water in which vegetable remains have been macerated, in connection with the fact that this disease is more prevalent in herds and flocks which graze on certain kinds of soils, especially such as are overflowed at some seasons of the year, give quite a degree of probability to the view that animals may be infected by germs whose cycle of life has been wholly independent of animal organisms.

In the case of diphtheria the application of a like explication of the origin of the many cases which we cannot trace to contagion would at present not be in accordance with the methods of exact science; yet in the light of what we do positively know there would be a large share of probability in so doing.

That filth in its various forms as found on the earth and in the atmosphere has some causal relation to diphtheria is abundantly shown in the opinions of numerous competent observers. Just what this relationship is, is still one of the moot questions. Some would affirm (and their claim as far as it goes is undoubtedly a valid one) that the filth merely acts in diminishing the resisting power of the individual so that he is more susceptible to the specific cause of diphtheria when it is accidentally presented. Others would maintain that the filth offers a field for the exogenous growth and multiplication of the disease-germ which may be implanted in it, either directly from a former patient or from the spores of the diphtheria germ borne to it by the atmosphere. From these local exogenous foci an endemic or even an epidemic-infecting influence may go out. As eminent an authority as Klebs lends authority to such a view.

If "epidemic influence" has any meaning, it means that the particulate germs or spores of some diseases are transportable to a distance through the atmosphere. As bearing on this question the report of Dr. Giddings, of Gardiner, is worth much; and in the same connection I would refer the reader to the report by Dr. Moore of the epidemic of diphtheria which was started in Bar Harbor by importation. He states that the first series of cases were imported and that the second series could be traced to the first as the source of their contagion. Then it appeared that an epidemic influence had been established, and as the result he began to find cases which he could not trace to a contagious origin. This is a very interesting fact well observed.

This view, however, of the origin of the so-called "spontaneous cases" of diphtheria rests upon negative testimony; yet, lacking though it does the respectability of exact science, its provisional acceptance would give us the explanation of some hitherto inexplicable phenomena in this disease.

There are, however, other methods of accounting for those cases untraced to sources of contagion. The fact that they are not traced is not always conclusive that they might not be traced. We are more likely to see what we are looking for, and if our mind is satisfied with the vague explanation which is implied in "atmospheric influence," "epidemic constitution," "cosmical influence," we shall not be so likely to see what may not be so semi-mystical a solving of the riddle. Cases are quite often reported which would seem to teach that the contagion of diphtheria is capable of being preserved for a considerable time. Very instructive in this connection is the report from Dr. Thomas of an epidemic of diphtheria in Yarmouth.

Coming here in 1870, I did not see or know of a case of diphtheria in this town until the summer of 1881, a period of eleven years. Then a family moved here from the town of Lisbon, where the disease was then prevailing, and in less than a week, the three children came down with diphtheria. Precautions were taken to prevent the spread of the disease, and it did not spread immediately. It was *six months* before the next family of four children came down with this dreaded disease. But they had become very intimate with the family that had it first. The same precautions were taken as in the first case and no further spread of the disease occurred at that time. But in about *six months*, July, 1882, it burst forth in its most malignant form in an old tenement house, containing three families, in which, and around which, the sanitary conditions were very bad. In the seven cases previous to this there had been no deaths, but there were twelve cases at once, which resulted in the death of one man and three children. The house was cleared out and thoroughly disinfected and the disease was thought to be effectively stamped out, but *six months* afterward, in the winter of 1883, a mother who had lost a little boy by the summer visitation, came across his cap which had been packed away all these months and gave it to a little boy living in another tenement, containing three families. In a week this little boy was dead from diphtheria. Two of the families had the disease and lost two children each. The other family kept by themselves, used disinfectants and escaped. These cases had all been at the upper village, Yarmouthville. Now one of these families, who had lost children in this last house, moved to the Falls village in about *two months*, into a part of a house. The other part was occupied by a widow with three children, one of which was a little girl. This little girl visited the family that had just moved into the other part of the house, and the lady, thinking, perhaps, of her own little girl that she had so lately buried, and wishing to please the little one, took from a drawer a handkerchief and gave her as a present. In about eight days this little girl was dead from diphtheria. The little boys were sent away when their sister was taken sick and thus escaped.

We may be taught by these cases, not only the simple fact of contagiousness, but that the life of this contagion is enduring. In the last Report of the State Roard of Health of Michigan, just received, quite a number of cases are reported in which the contagion had persisted six months or a year, and one case in which it presumably arose from cases which had occurred three years previously.

There is much in the history of diphtheria that would lead us to believe that the contagion may cling for a long time to persons and clothing that have been infected, and to dwellings and their surroundings where the disease has been developed. This persistent retention of vitality necessarily makes the finding of the sources of the contagion very often difficult or impossible. With these views the radical destruction as far as possible of the contagion whenever and wherever a case arises presents itself as an obvious duty.

As affording a possible explanation of the source whence the infection comes in some mysterious cases of infectious diseases, the reader is asked to notice what is said about *cats* and *dogs* in the communication from Bethel. This is not simply an individual opinion but these domestic pets are not often thought of in their casual relation to infectious diseases. Lately a gentleman was telling the writer about what at first seemed to him a mysterious origin of scarlet fever in his little boy. No other cases were near and no possible source of infection could be thought of. A little dog had come to the boy a few days before his illness and later it was found that he came from a home some distance away in which there had recently been scarlet fever.

It is well known that some of our domestic animals are prone to diphtheria, especially cats and dogs. Cases have been recorded in which there could be no reasonable chance to doubt the transference of the contagion from these sources. An Augusta physician relates that about a year ago the pet kitten of one of his children became sick with what appeared like diphtheria. The doctor thinks the kitten had diphtheria and that the child received it by contagion from the feline. There was no other case, nor had there been for some time, in town.

Jacobi gives an account from foreign sources of a diphtheritic epidemic in a hen coop: "Twenty-six hundred hens were imported from Verona, Italy, into a village, Messelhausen, in Baden. Some of these hens were affected with diphtheria when they arrived. Within six weeks six hundred of their number died of diphtheria, and eight hundred more soon after. In the following summer one thousand chickens were raised by artificial breeding, all of which died of diphtheria within six weeks. Five cats kept in the place also died of diphtheria; a parrot fell sick with it, but recovered. Besides, four of the six workingmen employed in taking care of the hens of the establishment were taken sick with diphtheria. Not a single case, however, occurred in the neighboring village. Thus, it is safe to assume that the diphtheritic disease of hens can be transmitted to man."

TYPHOID FEVER.

The cellar was wet, there being several inches of water on the bottom. The well was within thirty feet of the house. The slops thrown from the window drained into the well, which in wet weather was full to overflowing. There were two cases of typhoid fever in the fall. The next year a young woman, a domestic who had been in the house but two or three weeks, was taken with the disease, and removed to her home one-half mile. From this case there were seventeen others in succession.

In the place where the disease was transplanted this second season the well is thirty or forty feet from back door, in sandy soil and about fifteen feet deep. Privy I think in barn, forty or fifty feet from well. Family not neat and would be likely to throw discharges almost anywhere.

This condition of things reported from Cherryfield may serve as a fair sample of what is often found in a close and apparently causative relationship to cases of typhoid fever. That there is such a relation of cause and effect very often existing in these cases, especially as regards impure water, is the prevailing opinion of medical observers. Yet it may be questioned, and now-a-days often is, whether the filth conditions in the water consumed or in other places, is ever, of itself, a sufficient cause to start the typhoidal disease. It is coming to be more and more the fashion of medical thought to believe that infection with the specific typhoid germ is a prerequisite to the production of the disease. Water manifestly polluted may be used for years, and though it may cause more or less of general indisposition or predisposition to other diseases, yet typhoid fever may, or may not, arise. Let, however, the germ of this disease be introduced into such source of water supply and the chances are ten to one that we have a sudden outburst of the disease in the family.

Such a sudden outbreak on a gigantic scale is well known, to all newspaper readers, to have occurred last spring in Plymouth, Pa. This city took its water supply from a mountain stream, the water from which is gathered in a succession of three dams, or reservoirs, before its distribution through the hydrants. Chemical and microscopical examination both showed the water to be impure. The results of an investigation were that in the only house on the banks of the stream, between two of the reservoirs, there was a case of typhoid fever convalescing. The disease had been contradicted in Philadelphia. During the patient's sickness, a part of the time the discharges from the bowels were thrown without disinfection out upon the snow near the house and upon the bank which inclined sharply to the stream. When the snow melted the typhoid discharges were washed into the reservoirs, and suddenly, in due time, the extensive outbreak of the epidemic occurred which resulted in 1153 cases of fever and 114 deaths.

This same manner of starting an epidemic on a less ambitious scale is too often found in the farm-houses and other homes of our own State where the privy and the well are near neighbors. It is illustrated by the second year's cases reported from Cherryfield and also in one of the cases in Buxton.

While regarding a specific germ, which is yet not satisfactorily identified, as the indispensable factor in the causation of typhoid fever, we need not necessarily admit that the germ invariably has its genesis in the animal organism. Pretty positively settled are these facts; that from the typhoid fever patient the contagion is given off, principally at least, in the discharges from the bowels, and that the germ as passed is not in a condition to be infective; consequently, when cleanliness is observed in the care of both patient and room there is no danger of direct contagion. But as in the case of the diphtheria germ, the germ of typhoid fever is capable of maintaining its vitality for an indefinite time outside the intestinal tract whence it originated. Furthermore it is maintained that, as is the case with some other specific germs, it is capable of exogenous growth and multiplication, when the domestic surroundings which receive it offer it the requisite conditions. Ground once so seeded down with the undesirable germs may retain and preserve them some time, contributing them by percolation to the water which flows downward to the wells and fountains, or rising into the air in the vile exhalations. Many observed facts make this exogenous development of typhoid fever contagion highly probable, as does the following case reported in Germany:

> To the village of Reidheim there came from Ulm a young woman sick with typhoid fever. The dejections from this patient were thrown upon a pile of stable manure. No other cases followed until five weeks later, when upon hauling a part of this heap away, the persons so engaged were all, soon after, taken with the fever. In the same way the discharges from this second series of cases were buried in the same heap. No farther cases resulted until nine months later, when the remainder of the heap was removed. Then all those who did this work, who had not already had the fever, were taken down with it.

CONSUMPTION.

This dread disease is said to be the cause of one-seventh or one-sixth of all the deaths which occur in New England. There is reason to believe that our State as a whole is more exempt from consumption than most other parts of New England; yet it must be acknowledged that if our State or any parts of it offer any advantages of this kind we have no indisputable method of demonstrating it. As concerns this disease, or any other disease, we are wholly adrift, like the mariner without his compass, when we undertake to show where we stand. No registration of vital statistics has ever been made in our State to show our superiority, or to serve as a monitor where too high a local death rate prevails.

It will be seen, in looking over the reports from our correspondents, that the causes of consumption which are given are many. They *are* many, and the varying estimates of the importance of the various causes made by different practitioners very often represent a real difference in the climatic, telluric and social conditions environing their patients.

All the various causes of consumption may be arranged under these classes:

1st. Internal causes.
2nd. External causes.
3rd. Specific cause.

Under the first class belong all those influences inherent in the organic structure of the individual. These innate peculiarities of cellular arrangement, which Formad lately has claimed are demonstrable with the microscope, stamp themselves often upon the build and general aspect of the individual as well. No fact is better known to the medical reader or observer than this, that consumption is hereditary, or at least, that often some peculiarity has been transmitted from ancestry to child, which renders the individual more liable than others to become afflicted with tuberculosis. So much is indisputable; yet there is reason to think that the public generally are too much impressed with this truth. It is to be feared that this doctrine of predestination as applied to the etiology of consumption has blinded the eyes of the people to the value of other factors which enter into the causation of the disease. If these other factors should be found to have a greater potency than has been ascribed to them, and if, at the same time, they be such as may be subservient to the will of man, it must be admitted that this has been an unfortunate error.

The estimation of the part which hereditary predisposition plays in the causation of consumption varies considerably with different observers, depending much, it must be admitted, upon the surrounding conditions and circumstances of their patient, and somewhat, it is to be feared, upon preconceived notions.

Dr. J. H. Bennett, in speaking of the fact that several members of the same family often become affected, one after another with phthisis, says: "This, however, may depend not so much upon weakness inherited from parents, as it does upon a vicious method of rearing the infants and children of certain families. We have seen the children of many families become phthisical, in whom no hereditary taint could be traced, and have frequently pointed out, in the clinical wards of the Royal Infirmary, that, among six or eight cases of phthisis then present, not one could be traced to hereditary causes. Although, therefore, there can be no doubt that weakness in parents is a cause of weakness in the offspring, we are of opinion it is by no means so general or influential a source of phthisis as is usually supposed."

Dr. Flint, speaking of this same question, says: "But it is to be borne in mind that, owing to the frequency of this disease, a tolerably large proportion of tuberculous patients must have a consumptive percentage from mere coincidence; and it may be true that, sufficient consideration not having been accorded to this fact, hereditary influence has been over-rated. Walshe's statistical researches appear to give support to this supposition. Interrogating a considerable number of hospital patients affected with the disease, viz., 162, he found that of this number in 26 per cent either the father or the mother, or both parents, were tuberculous."

These opinions, from two representative physicians, the one English and the other American, both of whom have had unusual opportunities for observing this disease, are worth much in shaping our impression. But wishing to gain a more accurate statistical statement of the truth in this matter we adduce the following:

Dr. Quain's compilations from the Report of the Brompton Hospital for Consumptives shows that, among the lower classes of London, 25 per cent of the cases were hereditary, that is, that the disease had existed in one or both parents. In this connection it is to be remembered that a much greater prevalence of this disease occurs among the lower classes in England, as elsewhere, than among those in more well-to-do circumstances.

Dr. C. T. Williams, in the same city, among the more comfortably-conditioned classes was able to trace only 12 per cent to direct hereditary influence.

Dr. Muller, among 988 cases of consumption under his own observation, found 21.8 per cent whose parent or parents had had the same disease. This percentage would be increased to 28.6 if we included the brothers and sisters who had shown the disease.

In 900 cases in Buda Pesth, Dr. Koranyi found 20 per cent, including the brothers and sisters in the survey.

Thus from the few sources of statistical information at hand at the moment we must believe that at least 75 per cent, and probably more, of the cases of consumption are acquired from other than hereditary influences.

Passing lightly over the consideration of the second group of causes in our classification, namely, the external causes, or those due to the faulty environments of the individual, we stop only to say that these may be anything in the life or social condition which decreases the healthy tone of organism, thereby rendering its possessor more susceptible to the influence of the specific cause. Simply to enumerate, some of these predisposing causes are: impure air, deficient sunlight, imperfect alimentation, insufficient physical exercise, overwork, dampness of soil, climatic influences. Several or many of these, and others unnamed, are usually combined in exerting their prejudicial influence.

We are, however, just now more interested in considering the influence of the third in our classification, the specific cause.

As regards the influence of contagion as a factor in the causation of consumption, it may be said that until recently not a large proportion of the medical profession of this country and northern Europe have held any decided belief in the communicability of consumption. In southern Europe, however, for a long time there has been a prevailing opinion among both the profession and the laity that it is decidedly contagious. A brief survey of some of the observations and experiments which have wrought a change in our views, it is here necessary to take.

Observations like the following from a French source, of the occurrence of a successive series of cases of consumption in which hereditary influence could pretty certainly be excluded, kept alive a lingering suspicion that the disease might be contagious.

> A young girl, seventeen years of age, came from a robust family, consisting of a mother, father, son and two other daughters. She left her parents at the end of July, to work as a day laborer in the harvest-field in the commune of Chamblay.
>
> Chance led her into the service of a family in which there was a young girl suffering from pulmonary consumption. Whence came this sickness? Father, mother, brothers and sisters all enjoyed perfect health. One of the brothers had given up farming for the calling of a *mariner*. This is what those men are called in the country who pass their lives in guiding down the Loire, the Doubs, the Saone, and the Rhone, rafts loaded with pine logs for the construction of the maritime arsenal at Toulon.
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> Some time before the young girl became sick, her brother had taken her to Lyons to visit her friends. Among these was a young woman who was wasted by consumption in an advanced stage and with whom she remained for some weeks. Three months after her return she experienced the forerunning symptons of consumption. The malady was already far advanced when the young harvester from Martigny came to the house. She had so much sympathy for the sufferer, that the latter's parents offered her higher wages than she could get in the field, to remain with and care for their daughter night and day.

Tempted by this offer, the young woman remained, and for more than a month never left the invalid's bedside. Soon after her return to her family, she was seized with a dry cough. She had a hemorrhage from the lungs, and, after it all, the usual signs of pulmonary dissolution. She was cared for by her younger sister, a stout girl, who was a perfect type of a healthy, vigorous peasant. The young consumptive was buried a few months later. Her sister immediately thereafter began to experience the same symptoms, and, in spite of her strong constitution, was very rapidly carried off.

Consumption was arrested in this family because I ordered the second patient to be isolated from the others, advised the brother and sister not to take care of her, and made the mother, a woman sixty years of age, do so. She slept in an adjoining room, and carefully followed my directions to avoid breathing the air polluted by the emanations from the patient's lungs. Moreover, the sufferer spat into a closed vase, kept day and night by the chimney fire, so that the air was constantly renewed.

Of the correspondents in our own State a large proportion, it is found, have firm convictions of the contagiousness of consumption. Many cases illustrative of this belief are given, from which two or three are transcribed here.

A young man ill with phthisis married a strong, healthy young woman. Six months after her marriage phthisical symptoms developed in the wife. Her family history showed no case of phthisis, and she was perfectly well when married.

Mr. D. became engaged to a young lady, one of a family of nine children, without any hereditary liability to consumption. He belonged to a consumptive family and soon began to develop tubercular disease of one lung. As his health became feeble, the young lady was with him a good deal as companion and sometimes as assistant nurse. Within a year she became consumptive herself and died a short time after the decease of her lover.

Mrs. N. F. takes care of her husband's relative who dies of consumption. Mrs. N. F., who is forty years old, and always of good health, belongs to a family in which consumption was never known. In one year from the relative's death, she begins to droop, and in two and a half years dies of consumption.

A book might be filled with such cases culled from medical records. Other similar cases may be found in the reports from Belfast, Biddeford, Lincoln, Parsonsfield, Dexter and other towns.

Not only has the contagiousness of consumption in the human subject been noted, but veterinarians time and again have recorded the same fact as pertaining to tuberculosis among cattle which is identically the same disease as human pulmonary consumption. In the Report which was prepared on this subject for discussion at the

International Veterinary Congress held at Brussels in 1883, the Commission made the following statement:

> Contagion plays, in the propagation of this disease, a more active part than heredity, which very often does not sufficiently explain its frequency.

The following among other histories illustrating this point was given by Lydtin, Principal Veterinary Surgeon of the Grand Duchy of Baden, one of the Commission.

> In the month of April, 1878, the place of first tenant having become vacant at Obersasbach, W. was called upon to act in this capacity. In order to utilize some land placed at his disposal, in his function of schoo'-master, and more especially to provide his family with milk, he bought some cows. The first he bought in 1878, but in 1879 he sold it to a butcher. When slaughtered it was found to be tuberculous in the highest degree, so that its flesh could not be used as food. The second cow was bought on January 2nd, 1879, and lived for fifty-four days in the same stable with the first cow. It was sold to a butcher on December 10th, 1880, who returned the carcase to the farmer, as it was tuberculous to an extreme degree. The third cow was purchased on August 11th, 1879, and cohabited for four months with the preceding cow. It was soon killed because of tuberculosis. A fourth cow, purchased on December 20th, 1880, remained with the third until April 20th, 1881. It was sold on November 10th, 1881, but the buyer returned it because of an intermittent cough.
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> The first of these cows came from the stable of a neighboring farmer, who latterly had, it was reported, often exchanged his cows for others, and was compelled to have a milch cow slaughtered, because of advanced tuberculosis. The second cow had been reared by the vendor, and no diseased animals had been in his stables for ten years. The third cow was bought from a Jew dealer, and for several weeks after purchase did not cough. The fourth cow also came from an uncontaminated source. W.'s stables were in excellent order and well kept, and the cows were properly fed and cared for.

Observations such as these had left this question of the contagiousness of consumption resting upon a basis of strong probability, when experimental science took it up and placed it upon a foundation of unquestionable fact. So briefly as greatly to impair the force of the argument, the various lines of study which led to this result will be noted.

Experiments first systematically made in 1865–6 by Villemin to test the inoculability of tubercle upon animals have answered this question in the affirmative. In the experiments of this French investigator, not only were the products from tuberculous lungs in human consumption, but also material taken from the nodules of animal tuberculosis was used, and gave the same results, thus proving the identity of the "pearl disease" of cattle with human tuberculosis.

In 1868, Chauveau, another French experimenter, started an extended series of experiments to learn whether tuberculosis may be transmitted by the way of the digestive system. Various animals were experimented upon, and the diseased products which was fed to them consisted of milk from tuberculous cows, and flesh and lungs from diseased animals. These and subsequent work in this direction conclusively prove that the disease may be transmitted in this way.

In 1878, Tappeiner sought to prove whether the disease may be communicable by inhalation. Therefore he caused animals to breathe for several hours each day the air of a chamber in which tuberculous expectoration had been diffused in a fine spray by means of an atomizer. The expectoration of persons in the last stage of consumption was used. Dogs alone were made use of for the reason that these animals are not so susceptible to this disease as some others, therefore positive results with them would be more convincing.

Eleven dogs were put into the chamber and after a test of from twenty-five to forty-five days were killed In all (with one doubtful exception) were found well-marked miliary tubercles in both lungs, and in some cases also in the kidneys, liver and spleen. The quantity of expectoration used was very small,—in three cases only fifteen grains, weighed in its ordinary moist state, was daily atomized in the chamber.

These experiments though profoundly influencing the mind of scientists in the direction of the contagiousness of human and animal tuberculosis were not entirely conclusive as regards a specific contagion.

It was not until recently that doubts in this direction have been entirely removed, and this has been done by the indefatigable researches of Dr. Robert Koch, of the Imperial Board of Health of Germany. In 1882 he announced the discovery of the bacillus tuberculosis, or the germ which is the specific cause of consumption and other tuberculous diseases, and by special methods of staining was able to demonstrate its existence to the world. The importance of the discovery was quickly appreciated, and by following his methods the diagnostic value of this bacillus soon became apparent. Transferring directly, by inoculation, the bacterial parasite from diseased to healthy animals, Koch was invariably able to transmit the tuberculous disease; but, to meet the objection that, along with the bacillus, there was transferred some virus which was the cause of the disease, he resorted to the "dry slide" method of cultivation, to which reference has already been made, while speaking of the bacillus anthracis. The glass slides were covered with a coating of "blood-serum-gelatin", which after many trials he had adapted to the needs of these bacteria as a nutritive field. A minute speck from a tuberculous lung was brought to the surface of the prepared slide, and by means of the needle distributed along its surface. It is usually ten days or so before, with the naked eye, any change is observed on the slide; then there is noticed a dry crust or scale along the line of inoculation. After a certain number of days a minute particle of this dry scale is transferred to a new slide, and after another interval of time a portion of this to a third slide, and so on until the cultivation outside of the animal system has been carried on many months and through many cultures. When at last animals were inoculated with this last culture tuberculosis was invariably produced, and with more certainty and in a more rapidly fatal form than with the tuberculous matter taken direct from the tuberculous lung. These experiments were made with guinea-pigs, rabbits, cats, rats, mice and other animals, and in every case tuberculosis was produced.

These investigations prove unquestionably, not only that consumption is contagious, but that for the production of the disease there is needed a specific kind of contagion, to wit, the bacillus tuberculosis.

These microscopical studies of disease-germs have taught one fact which might have been inferred from previous observation of diseases, and that is, that these bacteria differ, not only in form, but that each has its biological peculiarities. For instance, the bacillus of anthrax grows and multiplies at any ordinary temperature, while the bacillus of tuberculosis requires a temperature maintained at pretty nearly the blood heat of the warm-blooded animals. Again, the bacillus anthracis, when transferred to suitable culture fields, quickly infixes itself and rapidly multiplies, while the bacillus tuberculosis slowly implants itself in new fields and grows with comparative slowness.

The establishment upon a positive basis of the fact that consumption is a contagious disease is a very important event from the point of view of preventive medicine. It enlarges considerably for the sanitarian the prospect of being able to diminish the prevalence of this scourge of civilized life. Not only is there now, as before, the same promise of good and positive results to come from an avoidance of all those debilitating, or predisposing causes which make a human organism a favorable field for the growth of the bacillus tuberculosis, but preventive, disinfective, or destructive measures, directed particularly to the bacillus, will obviate the danger of infecting others who are co-dwellers with the consumptive patient.

Under the microscope the sputa of the consumptive are found to be loaded with these bacilli, and their spores are thought to be characterized by the same persistent vitality as the spores of other disease-germs. Experimentally it is found that phthisical sputum may be dried for some time and pulverized, and that when, in this powdered condition, it is inhaled by animals, it still retains its infective powers.

In view of what is now known of the essential cause of consumption, what is suggested in the way of prophylaxis? Not it is hoped for humanity's sake, as has been suggested by some, that every consumptive patient shall be banished to a hospital for this class of cases, but that certain precautions shall be observed so that the danger of infection may be reduced to a minimum. First and most important, is the destruction by fire or by other trustworthy disinfectants, like the corrosive sublimate solution, of the life of the bacillus which is found in the sputa. Some of the disinfectant should be constantly kept in the bottom of the spittoon, which should frequently be emptied. preferably upon the fire.

The consumptive patient should sleep by himself and have his room as thoroughly and constantly ventilated as possible. With these few precautions there will be but little danger to others from the infection. Indeed, the fact that, in hospitals for consumptives, the nurses and attendants are not more liable to the disease than other persons, is no argument against the contagiousness of phthisis but is a powerful argument for good ventilation as is found in these institutions. The facts learned from the study of this disease and also from the biological study of the bacillus would lead us to infer that considerable concentration of the infection (as we would get in the close air of an unventilated sick-room) is usually needed to transmit the disease by inhalation.

REPORTS FROM CORRESPONDENTS.

Albion—G. H. Wilson, M. D.

Catarrhal and pulmonary diseases are the most frequent. There have been two epidemics of scarlet fever, one of typhoid fever, and two of diphtheria within the last twenty years, and in that time small-pox has been in the town once. The latter was brought into the town by a lady who was exposed to small-pox in Rockland. She came home to her family and was taken sick, and soon her husband was attacked with varioloid. I vaccinated the family and the result was two cases of distinct small-pox, three of varioloid, and three of vaccination. He paid the bills and there was no town charge.

A nurse for **Scarlet Fever** cases from the town of A—— went to her home, five miles distant, in great haste and did not change her clothing. She made no stay, not even to sit down, but got her things, took up her little girl of five years, kissed her and left. In a few days the child was taken sick with scarlet fever and died. There were no other cases within five miles at the time and none after.

Diphtheria has prevailed here in town twice very severely and hardly a child escaped. I sent one child of a family away as soon as the disease broke out, and that one did not have the disease while the others, four in number, died.

Cases of **Phthisis** are quite plentiful, caused largely by exposure to bad air, colds, dampness, etc. There are two families in town, in both of which the parents are very healthy but from which there have been lost during the last fifteen years, from one family four children, and from the other three, by consumption, and I think the cause is bad water and imperfect ventilation.

A lady, in perfect health and free from all hereditary taint, cared for her husband while sick with phthisis all the time for one year.

In six weeks after his death I saw her and exploration of the lungs showed that she was already far advanced in consumption. The disease ran a rapid course and she died in a few months.

The most striking faults in our **School-Houses** are imperfect ventilation and faulty methods of heating. There is frequent complaint of headache.

Alton—Asa Twitchell, M. D.

Since I have been here diphtheria and erysipelas have been the prevailing diseases. A few weeks previous to my coming, there were said to be about twenty cases of **Diphtheria** with six deaths and the cases that proved fatal were in families where hygiene was disregarded, and also the location of the buildings was near or immediately over low, marshy or boggy ground, where the water would stand in pools from early fall to late spring, and the filth from the house, barn and privy would collect here. Those patients that had good surroundings had the disease in milder form as a rule, and where there was early medical treatment and good nursing nearly all recovered. I noticed, too, that it appeared in different parts of the town and the reason seemed to be that they had been exposed to the disease; whether they would have had it just the same but for the exposure is not known to me.

Cases of **Phthisis** are frequent here.

In our **School-Houses** there exist cold floors, low ceilings and lack of proper ventilation. Headache is very frequently complained of.

Ashland—E. A. Duren, M. D.

Amongst our prevailing diseases I would particularize typhoid fever and scarlet fever. Scarlet fever has been among us for about two years, and has been very mild in most cases, there being only three or four fatal cases, and those were due to diphtheritic croup as a complication or sequel. The fever has only raged in small sections and has not been really epidemic at any time, but endemic. Diphtheria has visited us but twice in thirteen years. Once it was spread in a few families by a boy who had sore throat, and whose parents were away, and he allowed to run at large. It proved fatal in one case by invading the larynx and bronchial tubes. We have a few cases of typhoid fever every year. It has never been epidemic with us, usualy breaks out in September or October and leaves us when winter sets in, or when the heavy rains come. There has never been a case of small-pox in town.

I find cases of **Typhoid Fever** as the result of unsanitary arrangements. The privies and stables are always too near the wells.

We have not much of **Phthisis**. It is caused sometimes by neglected pneumonia with hereditary predisposition, and neglected bronchitis, also by being confined with the phthisical patient more or less of the time in small ill-ventilated rooms, and sleeping with or near such patients in taking care of them during a long sickness. I have had two or three cases which, I think, show that consumption may be communicated by infection.

Anthens—L. N. ELLINGWOOD, M. D.

The prevailing diseases are fevers, pneumonia, phthisis, diphtheria, etc. Three years ago measles prevailed in Bridgton and Kingsbury and also scarlet fever the same year in the latter place. Small-pox was here twenty years ago.

In our **Schools** there is poor ventilation and uneven heating. Much headache.

Augusta—W. SCOTT HILL, M. D.

In one instance there had been in a certain house a severe form of scarlatina, one or more cases terminating fatally. Thirteen years afterwards a family, in which there were two children, moved into the house without the rooms being painted or whitewashed. Both children had a very severe scalatina. A careful examination was made but that seemed to be the only reasonable cause as there were no cases in town and the children had not been away from home.

Among many cases of **Diphtheria** caused by contagion, the following occurred in a family where the sanitary conditions were perfect. A teacher complaining of sore throat, which was found to be diphtheritic, came to board in a family. All the members of the family, six in number, sooner or later had diphtheria, two dying with it. I had not seen a case that was apparently caused by unhealthy conditions.

In this city there have occurred a number of cases of **Typhoid Fever** for which the only traceable cause was a well which would naturally receive the soakings from a number of houses having open sink spouts and filthy water-closets. The well was on land several feet lower than the houses and some twenty feet from them. In another instance four families living on two sides of a square, and using water from a spring in the rear of buildings, had a severe form of typhoid fever. No other traceable cause. In no instance have I been able to trace it to decomposing animal or vegetable substances. In a recent case which resembled typhoid fever, sickness of a week's duration was caused by cleaning out a filthy drain.

Cases of **Phthisis** are comparatively frequent. Nearly every case can be traced to heredity, but the exciting cause in the great majority of cases is a cold, causing more or less bronchitis.

Augusta—W. B. LAPHAM, M. D.

Augusta is a remarkably healthy town. Catarrhal diseases are quite common, both in the acute and chronic form, the result, probably, of sudden changes of weather and the humidity of the atmosphere.

When diphtheria broke out in Oxford County in January, 1861, it was very fatal, many whole families of children being carried off by it. In the town of Woodstock, where I was then in practice, one family of three, one of two, and one of six children died within a few days. Sixteen children died in one small school district. It baffled us all. None of us had seen anything like it and could get but little information from books. In examining the family records of New England, I was struck with the mortality among children between 1735 and 1738, both in Massachusetts and in York County, Maine. I am satisfied now, from descriptions of it which I have seen, that it was diphtheria.

Augusta—J. O. WEBSTER, M. D.

There are no specially prevailing diseases, but the usual illnesses incident to our climate, acute catarrh, tonsillitis, epidemic influenza, bronchitis and pneumonia, rheumatic fever; very little typhoid fever.

There are occasional single cases of scarlet fever and, at considerable intervals, limited epidemics of the disease. There has been no extensive epidemic for many years.

There has never been a severe epidemic of diphtheria in Augusta but there have been occasionally several cases of the disease at a time. It mostly occurs in single, apparently sporadic, cases. It has not been as a rule of a severe type. There were, some years ago, very severe and fatal epidemics in some towns in this neighborhood.

Typhoid fever is rare in the city, and what we do see is mostly on farms. I do not think there are, on an average, six cases a year in Augusta. There have been two or three quite severe epidemics of influenza within the last ten years.

Small-pox has invaded the city four times within my recollection. It was imported by persons in every instance. The cases were isolated and the disease did not spread. I do not think that the city incurred any expense in these cases. I think three-fourths of the inhabitants have been successfully vaccinated.

I have do doubt the contagion of **Scarlet Fever** was carried home in my clothes and the disease communicated to my two children, in 1874. I have known other cases of its conveyance.

I do not think unsanitary conditions have anything to do with the causation of scarlet fever, but it is much more malignant under such conditions, and also on the borders of fresh-water ponds. I have seen a few cases where it was impossible to discover any source of contagion, but, as a rule, they were derived directly from other cases.

It is often impossible to ascertain the causes of **Diphtheria.** Contagion is frequently evident enough, but in many instances it appears to be sporadic or the result of a "cold." I remember an instance in which a woman, coming from a family in Massachusetts where the disease was present, brought the contagion to her own family, resulting in several malignant cases. In a school district in Augusta, where there had been a few cases, the opening of school was quickly followed by a great prevalence of diphtheria among the pupils, amounting to a local epidemic. I have no knowledge of the spread of the disease by public funerals. They are not permitted here in cases of death from diphtheria or scarlet fever.

I have observed cases where **Typhoid Fever** seemed to be caused by poor drainage of cellars, etc., but have not been able to trace a connection with the pollution of domestic water supply. I have seen several cases where there was an apparent causation of the disease by over-work and physical exhaustion. Homes have come under my observation where typhoid fever has occurred in successive seasons, and I have attributed it to the persistence, in these localities, of the original cause. From experience and observation, I cannot believe that the specific poison from a previous case is necessary to set up the disease. A strong reason for regarding contaminated water as one of the leading causes is, that it is so much more prevalent where the water supply is derived from wells than where it comes from a pond or river.

Cases of **Pulmonary Phthisis** are not very frequent in this vicinity, compared with its usual prevalence in New England.

About one-fourth of our mortality is from this disease, but as the total mortality of Augusta, for many years, has averaged only 12 per 1000, this gives an extremely low rate for phthisis. In my opinion, anything that impairs the general health, and lowers the tone of the system, is liable to occasion the development of phthisis, and more so in one with an inherited tendency to the disease. Many cases are sequels of pneumonia in previously healthy persons. I think that imperfect ventilation acts by impairing nutrition, while dampness, perhaps, may have some local action upon the lungs. I think that the bad ventilation of school-houses has much to do with causing consumption subsequently. I think that phthisis has prevailed most, in Augusta, in undrained localities with wet cellars, especially on the filled basins of undrained ponds. I have known many families in which the hereditary element was evident, especially where phthisis was present in the families of both parents, developing in all the children at 20 to 25 years of age.

I think of two cases now illustrating the infectiousness of the disease, where a wife, from a family free from consumption, has developed it after the death of her husband from this cause.

The most common faults in the **School-Houses** of this city are want of ventilation and bad lighting. This does not apply to the high school house or those in the village district. About 17 per cent of the pupils are absent from school, on an average, presumably on account of sickness. Headache is not now a frequent complaint. It was, formerly, in the village district grammar school, when ventilation was less efficient and the pupils were massed in the Principal's room, only going out for recitation. Each class in that school has now its own room. If a case of scarlet fever or diphtheria were found in the school-room, the patient and all the other children from the same family would be excluded from the schools, until satisfactory evidence was furnished of the propriety of their return. The school-room would be disinfected and perhaps the school would be closed for a few days. Strict watch would be kept for the premonitory symptoms of other cases among the pupils. No particular school-houses have been noted for unhealthfulness, and I have not known of cases of serious disease or of death of teachers resulting from over-work or from unhealthy conditions of the school-room.

Baldwin—JAS. NORTON, M. D.

I came into Baldwin in 1834; then the scarlet fever was prevailing as an epidemic. I had many cases, and have had cases of it every year since but not as an epidemic. I first saw **Diphtheria** some twenty-five years ago, when in many localities it prevailed badly. I have had cases every year since, but not so bad as they used to be. I have not seen a case of **Typhoid Fever** this season and but few for five years past; it prevailed here in 1837, when I had one hundred cases. **Small-Pox** has invaded our town three times, first brought here by a man from Boston, given to a whole family, all lived through it; paid their own charges. Second brought from Portland by a girl, and gave it to family who paid all but cleansing house, which cost the town $20. Next case was brought from Cornish where a man's father died of the disease and had public burial: he gave the disease to two families; the town paid only for doctoring and cleansing, and this finally was paid by Cornish. South Baldwin has paid but a trifle for the disease.

I believe that **Scarlet Fever** is the most contagious disease we have, and have known cases where it was carried in clothes; and from my practice I am satisfied that it will keep for a long time concealed.

Diphtheria has been prevalent in this place. I have seen much of it.

Phthisis is common here in Baldwin, caused by exposure to cold and dampness. In my opinion, the disease is hereditary. I am satisfied that a scrofulous person will contract consumption by being in contact with a consumptive person.

Bangor—W. L. LUNT, M. D.

The principal diseases are cholera morbus, cholera infantum and enteritis; tonsilitis, bronchitis, croup, pneumonia, phthisis, erysipelas. Very little typhoid this year, while in 1884 it was very prevalent. A majority of my typhoid cases were not accompanied by diarrhœa. Very little of scarlet fever in the last ten years; none in last five years. Ten years ago a violent epidemic of diphtheria in an extremely hot summer, starting at Eddington Bend, since which time until within one year it has broken out more or less severe, within a radius of two miles from Bangor. For one year the disease has remained comparatively quiet, only isolated cases occurring. The epidemic tendency is warded off by the survival of the fittest. Typhoid fever has not prevailed as an epidemic during the last ten years. Measles, whooping cough and mumps have each prevailed twice as an epidemic within ten years.

Scarlet Fever was in a certain family who secluded the healthy child instantly by sending it to the sea shore. After the convalescence of the sick, she joined the well child at the sea shore. In seven days the latter was taken sick and died sixty miles from the original seat of infection.

A healthy lad went several miles and attended the funeral of his mother who died of **Diphtheria**. He came down in two days with the same disease. There is great danger of the spread of diphtheria in the schools when it once has gained an entrance. The school should immediately be closed for ten days as soon as the first scholar is taken. In the meantime the school-house should be fumigated with sulphur, and when school re-commences, the scholars should be daily questioned about their throats and any inflamed cases sent home at once to await results. We have no public funerals over fatal cases in Bangor or surrounding towns. The dead are buried at once; the rooms, bed and clothing all disinfected, and burned when it cannot be disinfected.

Cases of **Phthisis** are frequent. In considering the causes it should be borne in mind that favoring hygienic conditions may raise an inherited tendency to a condition of soundness of body, or wrong conditions may lower it to consumption.

Bangor—R. K. JONES, M. D.

Comparatively little typhoid; occasionally scarlet fever prevails; diphtheria quite often, one or more cases. The latter first appeared, in recent years, about 1869 or a little later. At that time quite fatal in West Bangor. Since then it has been worse among the French Settlements in neighboring towns than in the city. Since 1857, when my residence here began, **Small-Pox** has appeared once in early winter of 1864, again in 1872, and perhaps other isolated cases. All instances of infection have come from abroad. In 1864 there were eight cases in two families and the expense to the city probably $500. In 1872 the infection was, I believe, disseminated by the careless manner in which the straw used in the bedding of the first case in pest-house was destroyed. The straw and other infected articles which it was desired to destroy were placed in a pile out of doors and fire applied at the bottom. The dense smoke thus caused ascended through the pile, became laden with the infection and floated off on the wind, spreading the infection quite extensively. I estimate the cost to the city to have been over $5000.

Diphtheria has been somewhat prevalent, the causes appearing to be, 1st infection and 2d filth. The disease is very often spread through schools, generally by convalescents with persons and clothing not disinfected.

Cases of **Phthisis** are not particularly frequent; but more among the Irish population than among other classes. The more operative causes are infection, inheritance, damp soil, bad diet, exposures, &c.

Bangor—S. B. MORRISON, M D.

In 1846 I had charge of twenty or more cases of **Small-Pox** in the city; fortunately none proved fatal. The source of the infection could not be accurately ascertained. The disease was concealed from the authorities two or three weeks, so that a few persons who had been infected went into one of the neighboring towns and carried the disease there. During that year and the next there was a very thorough vaccination. Personally I vaccinated as many as three thousand individuals in the city, which then included what is now the town of Veazie. There were a large number of cases here about ten or twelve years ago. There have been occasional cases since, but they have been rare, as vaccination has been generally practiced in the public schools. I have not known of any cases for the last six or eight years. On the thirtieth day of August, 1849, after a somewhat protracted period of warm and very dry weather, **Cholera** appeared here. As I was City Physician at the time, I had charge of the Alms House and the Cholera Hospital. During its continuance until the 16th day of October there were, as nearly as could be ascertained, 320 cases of decided cholera, besides a large number of incipient cases. Just about one-half the cases terminated fatally. This was a very large number considering that our population was then much less than now and that many had left on account of fear. The city was at that time in a very filthy state and the sewerage very imperfect. In fact there were not any but private sewers. Immediate measures were taken to remove the most serious sources of filth and to construct sewers, and I think there has not been a case of cholera in the city since. A very large proportion of the cases were in the lower and most filthy parts of the city and among the very poorest and most destitute part of our citizens, though there were a few fatal cases among the best class of citizens living on high ground and in apparently healthy localities. One fact was very prominent in that there were a larger number of deaths on Sunday than on any other day, supposed to be from the fact that a large portion of those persons living in the most unhealthy localities, principally Irish, bought more freely of vegetables on Saturday evening than on any other. On Sunday, Sept. 15th, there were sixteen fatal cases and on the Sunday following 22 cases. Some of the deaths were very sudden. On one day at ten or eleven o'clock A. M., four laboring men walked to the hospital and said they were sick. They were put into one room in two beds, as our accommodations were limited, and all four were dead in less than six hours. As cholera had never been here before, two or three physicians and several nurses came from Boston and remained for weeks, but I could not discover that they were more successful in treatment than had been the local physicians.

I take the liberty to be thus minute as to cholera as all the physicians who were in practice here at that time have passed away, except one, who has for years been confined to his house, and myself.

Bar Harbor—J. S. Moore, M. D.

The prevailing diseases during the year that I have been here have been diphtheria, typhoid fever, consumption and cholera infantum. These I have named in order of frequency.

Last winter, 1884–5, an epidemic of **Diphtheria** of frightful violence occurred here, in which more than 30 per cent of the cases terminated fatally. As regards causation it seemed to me the first half dozen cases (there were thirty-five cases in all) were traceable directly to importation. Of these cases all the subjects had been away to infected towns and either came here sick with it or came down with the disease soon after their arrival. Following these cases were about a dozen cases caused by coming in contact with the first class. These occurred in consequence of carelessness in some cases, necessity in others and accident in still others. Now follow the more interesting part. After these cases occurred it seemed that an epidemic influence had been created, and it then broke out here and there about the village, regardless of contiguity to other cases, but these cases so occurring chose in almost all instances homes in which were found some faulty hygienic condition, for instance, an obstructed drain connected with the sewer, an earth closet that was foul beyond all manner of decency, the drain from a stable, a stagnant pool of water, etc., etc. Of the other cases that occurred without any possible means of explanation (some six or eight) it seemed they were perfectly isolated from infected homes or diseased subjects and were furthermore living according to the dictates of modern sanitary knowledge. It was an interesting fact to me (if fact it was) that an epidemic influence could be engendered by cases due without doubt to importation. To prove, time and space forbids my introducing arguments more than to mention that the same localities where the disease was last winter epidemic, were in every instance in as good condition as they had been in for years and many of them were better. Furthermore the type of the infectious class was precisely similar to that of the contagious class, (those that could not be traced to other cases and those that could), the form which the two classes took were one; and they all died, with one (possibly two) exceptions with the same complication, croup.

During the past autumn we have had a visitation of **Typhoid Fever**. Ten cases occurred. The first three were at a house where the basement was receiving the drainage from the largest stable in town. It had been considered dangerous by the inhabitants before any one was taken sick. The smell eminating from the cellar was, to say the least, *decidedly nasty*. There is no doubt that the long-continued production of filth in that basement produced the disease.

An interesting statement that I may make in this connection is that the first case seemed so little like typhoid that I was obliged to watch its course a week or more before I was sure of my diagnosis. The next case was not so blind, but for the first week a physician might with but little impropriety have called it anything but typhoid. The last two weeks it pursued the regular course. The third case was typical from the beginning. I advised the family to abandon the house, which they did and none of the rest of the family (numbering three or four) have since been sick. The next case was at a house where the privy and well were too near neighbors, and a continual drain from the former to the latter occurred. Another case was traceable to two sources, either of which would have produced the disease in all probability. It was a young man whose shop was in an unoccupied space in the back of the village, where most of the garbage was dumped, which rotting almost under his nose all through the hot season, it is surprising he did not take the disease before. Soon after, his wife was attacked and an investigation revealed an obstructed drain connecting with the house drain.

This may be considered a fair example of the causes of nearly every case. Two cases occurred in two homes in the village which are supposed to be as perfect in drainage and as complete in hygienic appointments as could be made. We may sum up all I have said relative to the cause of diphtheria and typhoid in a line by saying, They have been produced by allowing filth to accumulate. Given an area large enough and no filth, no diphtheria or typhoid. During the present generation only two or three cases of small-pox have occurred; these at different times and in different parts of the town, but thanks to vaccination they did not spread.

A family had **Scarlet Fever**. At the time of the outbreak mother and daughters engaged in making rugs from rags. Some died; others moved and the house was unoccupied for several years, reliable people say five years. A family then moved in and lived there several months at the end of which time they "took" to making rugs and dug open the barrel of rags that was set aside by the former family. Two cases of scarlet fever followed, mother and daughter, only females in house; both died. These were the only cases that occurred in the district.

I was attending a family whose children (three in number) were all sick with **Diphtheria**. All died from croupous form. The nurse believed it was not possible to carry the disease in clothing and said she would not change her dress upon leaving the house. She was not afraid to take her children in her lap upon going home. She was admonished against such a fool-hardy course. She told the neighbors a week after being home that she did not change her clothing after coming from the infected house, and, said she, "My children have not got the disease." Ten days after her leaving the infected house I was called to attend her family with diphtheria of the most fatal form I ever saw. One child died in thirty-six hours after it was attacked. These were the only cases that occurred anywhere in the neighborhood of the nurse's home. It is needless to remark, that nurse now believes it is *very* contagious.

A neighboring practitioner says he has one well "that has pumped him up $100 a year for five or six years;" meaning that it has been the source of recurrence of typhoid fever for five or six years.

We have a great many cases of **Consumption**.

Our **School-Houses** as a general thing are well constructed. If they lack in any particular it may be ventilation; though it is believed in this regard they are very well provided for.

Bar Harbor—C. C. MORRISON, M. D.

The prevailing diseases are, phthisis, bronchitis, pneumonia and diphtheria. The only epidemic of note was that of **Diphtheria** from Oct. 1884 to the May following. There were about 50 cases and 10 deaths. Most of the deaths resulted from diphtheritic croup. The first cases sprang up in two low places where piles of manure and reeking privies prevailed, and where all kinds of slops and filth were thrown out. I believe the epidemic started from these causes. Small-pox has not been here for years.

Consumption is quite frequent. Hereditary influence is the most potent cause. Its course is hastened by bad ventilation. The bad air of school-houses may have something to do with causing it, but not one-tenth as much as that of close sleeping-rooms.

Baring—J. R. N. SMITH, M. D.

We have more of typhoid fever and phthisis than of any other diseases. We occasionally have an epidemic of scarlet fever, only isolated cases of diphtheria, typhoid fever every year, beginning in August or September and continuing till cold weather. Small-pox three times within the past thirty years. Always brought from abroad and has never spread.

I do not remember a single case of **Scarlet Fever** derived in any other way than through infection.

All the cases of **Diphtheria** have been isolated cases and have not spread at all. Decaying vegetable matter has seemed to be the cause.

Bath—M. S. BRIRY, M. D.

The prevailing diseases are catarrh and pulmonary phthisis. During the thirty years of my practice in Bath, scarlet fever has prevailed a number of times, but only one epidemic in malignant form. The first case of diphtheria, recognized as such in Bath, I treated in 1861. During that and the following year diphtheria prevailed here, and in some families was quite fatal. Since then there have occasionally been some cases, but for a number of years very few. With one exception there has been only a case or two of **Small-Pox** in any one year. In 1863 I treated a sailor sick with the disease. In 1865 a discharged soldier came from Augusta to Bath with varioloid. At first the case was pronounced chicken-pox, and as the man was not sick enough to be confined to the house he went about among people where he was acquainted, and twenty-two persons took the disease from him, some of them varioloid, and some, the larger part, variola. Being at that time City Physician, twelve of them I treated at the hospital, or "pest-house," the others at their residences. All recovered. Typhoid fever has not prevailed here as an epidemic. There are a few cases nearly every year, or at least a few cases called by that name.

The following two cases I send to show that the contagion of **Scarlet Fever** may be preserved for some time in communicable form in clothing: A girl went from Bath to Massachusetts to a school for young ladies; and during the term a number of the young ladies had scarlet fever. After her recovery this girl came home to Bath, and a trunk containing some clothing worn when she was sick was put away in an unfinished chamber; some six months after, two little children were at play in the chamber, opened the trunk and took out some of the clothes. In about a week from that time both children were taken sick with scarlet fever in very severe form and one of them died. There were no other cases at the time near. Some years ago one of my neighbor's children had scarlet fever in a severe form in autumn. The next spring my little boy went into that house and sat upon a lounge which was in the room where the children had been sick. In a week from that day he came down with scarlet fever. He had not been where the disease was and there were no other cases near at the time. Nearly all cases come from infection. I remember only two where I could not trace them directly or indirectly to other cases.

There are many cases of **Phthisis**. More deaths from this disease in Bath in proportion to the number of population than in Portland or Bangor. Heredity is the principal cause.

The most serious troubles with the **Schools** are poor ventilation of the buildings and dampness of the soil under and around them. Headache is much complained of.

Bath—E. M. Fuller, M. D.

At least one-quarter of the city is situated on low, flat, swamp land. Another one-quarter of the city is fairly healthy, while the remaining half is in a better sanitary condition, from the fact that it is located on a higher grade of land, and occupied by a wealthier class of residents, who could naturally maintain more healthful conditions of sanitation than the lower or middle classes.

The following exhibits the mortality record of the city for the past twenty-four years:

1863.	
No. of deaths	178
Consumption	34
Zymotic diseases	73
Unknown	44

1864.	
No. of deaths	192
Consumption	44
Zymotic diseases	60
Unknown	38

1865.	
No. of deaths	173
Consumption	30
Zymotic diseases	57
Unknown	40

1866.	
No. of deaths	140
Consumption	35
Zymotic diseases	41
Unknown	23

1867.	
No. of deaths	130
Consumption,	(no record)
Zymotic diseases,	(no record)
Unknown	32

1868.	
No. of deaths	125
Consumption	38
Zymotic diseases	23
Unknown	18

1869.	
No. of deaths	134
Consumption	33
Zymotic diseases	35
Unknown	33

1870.	
No. of deaths	169
Consumption	35
Zymotic diseases	68
Unknown	31

1871.	
No. of deaths	162
Consumption	33
Zymotic diseases	68
Unknown	31

1872.	
No. of deaths	142
Consumption	30
Zymotic diseases	24
Unknown	5

1873.	
No. of deaths	132
Consumption	30
Zymotic diseases	31
Unknown	6

1874.	
No. of deaths	176
Consumption	43
Zymotic diseases	48
Unknown	1

1875.	
No. of deaths	187
Consumption	49
Zymotic diseases	39
Unknown	0

1876.	
No. of deaths	197
Consumption	43
Zymotic diseases	68
Unknown	3

1877.	
No. of deaths	226
Strangers	14
No. in city	212
Consumption	45
Diphtheria	32
Typhoid fever	7
Scarlatina	5
Cholera Infantum	13

1878.	
No. of deaths	193
Consumption	36
Diphtheria	29
Typhoid fever	10
Scarlatina	4
Cholera Infantum	11

1879.	
No. of deaths	133
Consumption	25
Diphtheria	6
Scarlatina	1
Typhoid fever	5
Cholera Infantum	5

1880.	
No. of deaths	145
Consumption	43
Diphtheria	4
Scarlatina	3
Typhoid fever	5
Cholera Infantum	3

1881.	
No. of deaths	117
Consumption	23
Diphtheria	2
Scarlatina	3
Typhoid fever	10
Cholera Infantum	6

1882.	
No. of deaths	121
Consumption	23
Diphtheria	2
Scarlatina	3
Typhoid fever	5
Cholera Infantum	11

1883.	
No. of deaths	151
Consumption	29
Diphtheria	6
Scarlatina	3
Typhoid fever	10
Cholera Infantum	11

1884.	
No. of deaths	178
Consumption	46
Diphtheria	8
Scarlatina	5
Typhoid fever	10
Cholera Infantum	2

From the foregoing statistics it will be observed that there are many tabulated as "unknown." That comes about from the faulty way in which the record was kept. Allowing that 50 per cent of these were from zymotic causes (and it is believed this is fair) then the whole number of zymotic deaths in 20 years amount to 921 plus 149 equal 1070. Whole number died of consumption in 20 years, 788.

We usually have an epidemic of scarlet fever every three years, generally of a mild form. This spring we had only a few cases. Small-pox has appeared three times in the past twelve years. The first case has usually been brought here by sailors. The last epidemic was started by a citizen taking the disease while riding in the cars. It was given to several members of the family before it was recognized. Ordinary cases are taken to the "Pest-House" and cared for by some nurse who has had the small-pox.

As illustrating how the poison of **Scarlet Fever** may long retain its vitality and then transmit the disease, the following cases are given:

Case I. A child five years old had scarlet fever of a severe form and died. Its playthings, a Primer among others, were taken and packed away for a full year. A little child came to the house visiting and the Primer was taken out to amuse the child with. A few days later the child was taken down with scarlet fever and died. There were no cases of the fever in town, and the child had not been out of town, and there were no others.

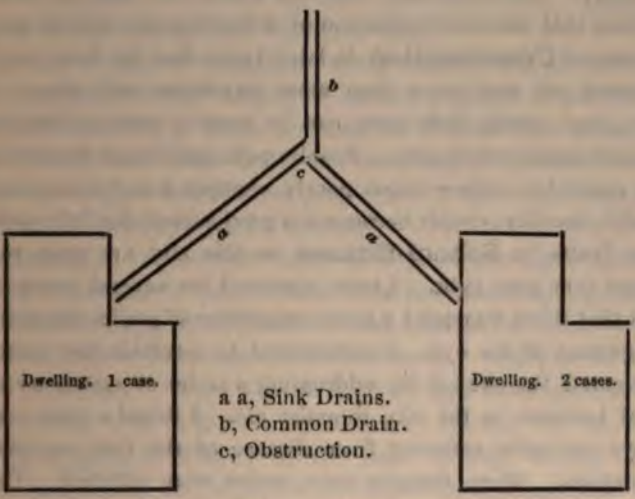
Case II. My own eldest son when two and one-half years old went with his mother to visit in the country where a year previous they had had scarlet fever in the chamber that they occupied. The room had been fumigated, papered and painted after convalescence, and the furniture had been cleansed. They neglected, however, to take up the carpet, which had been thoroughly sprinkled with carbolic acid. My boy played upon the carpet and in less than ten days he was taken with scarlet fever of a severe type. There were no cases near there and hadn't been for a year. The cases the year before were epidemic and not dependent on unsanitary conditions of the house. I am satisfied my boy took the poison from the carpet. I have known of the disease having been spread by public funerals.

There are occasional cases of **Diphtheria** in Bath almost every month in the year, though for the most part they are of a mild form. Six years ago we had quite a severe form of the disease. I remember of treating 93 cases.

Filth and garbage about houses and cellars, damp localities, filling of low, damp places with sawdust, surface drains running under houses, unsanitary privies, etc., are the cause usually. A man living in a village had an old rotten plank walk running from the sidewalk to his back door. He dug it up and piled it in his back yard, a decaying mass of vegetable matter. He had six children and a wife. They were all taken down with diphtheria in a few days, and they all died but one child. Physicians investigated the case carefully and were unanimous in the belief that the decaying vegetable matter, etc., caused the cases.

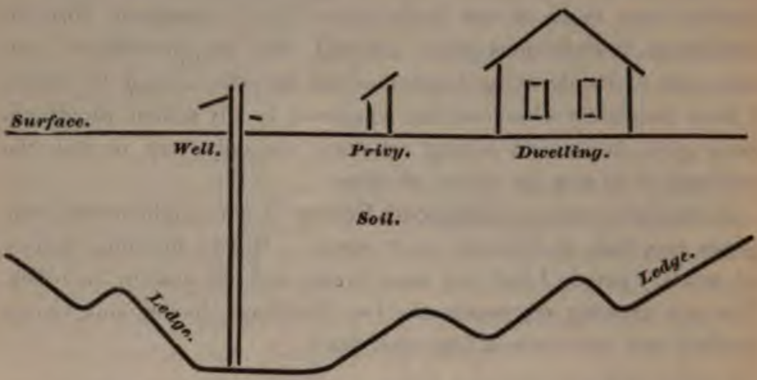
Case III. A farmer cleaned out his cellar, in the spring, of decaying vegetables, among which were potatoes and cabbages. The cabbages were in a very rotten and decaying condition. His whole family were taken a few days after with a malignant form of diphtheria. Physicians were satisfied that the disturbance and exposure of the decaying vegetables was the sole cause of the cases. I have frequently observed that whenever, in any school, diphtheria once gets introduced among scholars, the only way to stop the epidemic is to stop the school at once.

I had eight cases of **Typhoid Fever** in one neighborhood four years ago, "all in a bunch," so to speak. In two adjoining houses of wealthy people I had two cases in one and one case in the other. The pen drawing represents the two dwellings, having sink spouts leading into one common four-inch drain.



At the time of my attendance I began to ascertain the cause of the cases. There was a fearful stench in the vicinity of the back yards which led me to have the sink drains dug up. A large "dish cloth," with other debris at (c) had plugged the drain. All the dish water and other watery slosh had completely filled the soil from the overflow. Every physician who investigated the matter agreed that the faulty sink drain was the cause of the cases.

The whole city, so to speak, is on a ledge. There are not twenty good wells in Bath. Upon investigation of very many cases of disease from impure water in this city, I have found in general terms many to be located like the following:



I think that the bad ventilation of school-houses figures more as the cause of **Consumption** in later years than the laity have any conception of, and more than most physicians will allow. How many puny, sickly little ones can be seen in some of the school-houses of nearly every city. Feeble, pale and almost feverish from being packed in a close room poorly ventilated and in a cheap and unhealthy locality, simply because it is good enough for little children.

The faults in **School-Houses** in this city are poor ventilation and very poor light. I have observed for several years in one school that there was quiet a large proportion of pupils affected with derangement of the eye. I endeavored to ascertain the cause and investigated the subject by addressing a series of questions to the several teachers in the city to assist me. I found a large number of boys and girls suffering from disease of the lids, myopia and astigmatism. More females than males were affected. Then I found corresiretis common and persistent. I also found a very large number of cases of naso-pharangeal catarrh, which I considered was due to the condition of the school-houses with consequently bad ventilation. The investigations in connection with school-houses and school children are of great importance, not only on account of the children themselves, but for the future of the race, for my investigations revealed to me things that the books do not dwell upon to any intelligent degree. Quite a large percentage of scholars are absent on account of sickness. Headache is a frequent complaint. In one school-house that I visited during my enquiries the attic had been used as a privy during a whole winter session. The teachers or school authorities did not know of it till I called their attention to the facts. Diphtheria was prevalent at the time in the vicinity. Then there are many school-houses unhealthy from other causes. There are very many very unhealthy wells in proximity to school-houses where children drink the water continually with deleterious effects.

Bath—A. J. FULLER, M. D.

We have had **Small-Pox** ten times since I have resided here, generally contracted abroad and brought here by the person exposed. It has never cost the town anything unless they were paupers. Probably three-fourths of the people are vaccinated. We have in years past had sporadic cases of **Yellow Fever** brought here from foreign ports; all under my care have recovered. **Cholera** prevailed here years ago and was quite fatal.

I have seen cases of **Scarlet Fever** where I had no doubt that it was communicated by clothing of infected persons. It was brought here from Boston by a family that had the disease one month previous. Cases have come under my observation in which clothing has for some time retained the poison, and I have also known the disease to be spread by public funerals.

Diphtheria has several times been prevalent here, caused I think by atmospheric peculiarities with poor sanitary conditions. The disease will spread in schools unless isolated at once. I have known the disease to be spread by funerals and would never allow a public funeral if I could prevent it where diphtheria prevailed.

I have often been unable to satisfactorily account for the recurrence of **Typhoid Fever** in the same locality. I am of the opinion that animal and vegetable decomposition has much to do in producing typhoid fever and good sanitary conditions have not always been sufficient to prevent the fever. The best of sanitary conditions should always be enforced as a safeguard if not a perfect protection.

My observation has been that **Phthisis** is not so frequent in this city as in some other localities. I believe hereditary influence is the main cause; next to that damp locations and poor ventilation in many residences. I think there is danger from the inhalation of the breath of the phthisical patient, also from the matter raised from the lungs. I would have it burned as soon as possible, not remain in the room or on the bed as is often the case unless ordered to be removed by the physician.

Our **School-Houses** are mostly very good; high, airy rooms, very well ventilated if teachers pay attention to the matter of ventilation.

Belfast—JAS. H. SHERMAN, M. D.

Measles prevailed in 1802 and nearly half the deaths in that year were from this cause. Dysentery prevailed in 1825 and within six weeks one-half the population were attacked. It proved fatal in 75 cases, 45 of which were children under four years. Small-pox has invaded the town three times. In 1819 from infected clothing, with one death. In 1837, brought by a vessel from Boston. Precautionary measures prevented the spread of the disease to any extent and only one case was fatal. In 1851 considerable alarm was excited by the appearance of the disease, from what source is unknown. There were twelve cases only and one death.

Through fear consequent upon the advent of the disease vaccination was made compulsory and without absolute knowledge I should judge that fully seven-eighths of our present population had been successfully vaccinated.

An infant was very sick at a hotel, of **Scarlet Fever,** but recovered. The room was *said* to be properly cleansed and occupied from time to time by transient guests. Six weeks after, a weak and puny child of three years, from the country, where no record of any contagion existed, occupied the same room with his mother. He sickened and died within a week, of scarlet fever. Can account in no other way for the disease except a retention in the room, and the seed, falling upon favorable ground, germinated.

I have frequently known of scarlet fever's being spread by *public funerals* in other localities, but am not aware of any such case here. I am of the opinion that the funerals of patients dying from this disease should be as soon as possible and strictly private, and that if the people cannot be brought to a realizing sense of their danger, the aid of the law should be invoked to compel proper precaution. Setting aside infection from actual contact with the disease I am fully convinced that unsanitary conditions are the prime cause of scarlet fever, especially when the powers of the patient are enfeebled by want of proper food or clothing or from any cause that tends to reduce the vitality below the normal standard. The greater proportion by far are due to infection, which liability to infection is increased by uncleanly habits, improper food or want of sanitary precautions.

We have had, here and there, an isolated case of **Diphtheria,** but no epidemic. The more frequent causes have been an unhealthy, ill-conditioned body with filthy surroundings and improper nourishment.

As an instance of the causation of the disease by unsanitary surroundings I would give the following: S. E., aged six years, a delicate child from his birth. The house occupied by the family was in low ground where in wet weather the water would stand in pools and in the dry times would stagnate and fester in the sun. After sunset, always damp and misty with the peculiar odor of decaying vegetable matter in the atmosphere. The barn and outbuildings in a filthy condition, the offal from the kitchen thrown broadcast upon the ground, no drainage except that provided by nature, and the water for household purposes obtained from a well that could not have been otherwise than contaminated from its surroundings. The result in the case mentioned was death, and two other children of the family were only saved by immediate removal and the utmost care. Where children are closely herded together as in school, with ventilation usually of the poorest kind, the disease must spread. Complete isolation ought to be the rule and the funerals as in scarlet fever should be speedy and private. The clothing can be disinfected but I question whether as a matter of economy it would not be better to cleanse by fire. Do not recall a case that could be traced directly to a public funeral, but I am satisfied that if we could reach all the evidence in the various cases the fact could be established beyond all doubt.

Phthisis is not frequent in our city. Hereditary tendency in connection with want of pure air and nourishing food are the most potent causes. Perhaps the parts which imperfect ventilation and dampness play in causing consumption are nearly equal. The dampness and cold causing irritation and congestion of the lungs, and poor ventilation filling the lungs with vitiated air and dust particles, producing practically the same result. I do not think the imperfect ventilation of school-rooms has so much to do with causing this disease as the uncomfortable and unnatural positions of the pupils, and the want of suitable care that the clothing should be comfortable rather than fashionable. I think the hereditary tendency can, when taken in connection with the family history, be always satisfactorily ascertained. As bearing on the question of infectiousness I give the following:

Mrs. R., a healthy Irish woman, aged twenty-four, with no record of the disease that could be ascertained in any branch of the family. Her husband, aged thirty, was found upon examination to be far advanced with the disease. It was supposed that he might live for two years but could never regain his health. The disease in his case was beyond all doubt inherited. His wife devoted herself thoroughly to his comfort and did all in her power to make the short period that was left for him as endurable as possible. They occupied the same bed and she was constantly about him ministering to his wants. In three years she died from the disease plainly marked, while, singular to relate, as she drooped he appeared to recover. After her death he began to fail, and died in something under two years. I had long held the theory of the infectiousness of this disease and this case seemed clearly to establish the fact.

The faults in our **School-Houses** are unequal distribution of heat, unequal distribution of air and an improper arrangement of windows for lighting purposes. I do not think the yearly average of absence from sickness would exceed 5 per cent. Headache is a frequent complaint, but not more among those attending school than those at home, and quite as frequently perhaps from outside causes as from any fault in the school-room. I cannot say what would be done if scarlet fever or diphtheria should be found in the school-room, but if I were to decide I would isolate every member of the family in which the diseases prevailed until all danger of infection had passed.

Bethel—J. A. MORTON, M. D.

Scarlet Fever has prevailed considerably among children, sometimes very severe and fatal, in sporadic cases; but never epidemically to any great extent since my residence in this town, now eighteen years. But I am informed that in the summer of 1833, a terrible epidemic swept over the town, reaching into some of the surrounding towns. It originated (cause unknown) on Bethel Hill, and its malignancy was greatest there. It rapidly invaded every family, sparing not even adults, was sudden in its attack, and no treatment seemed to avail in many cases; sometimes two or more would be lying dead in the same house. As to **Diphtheria,** I have had only sporadic cases, not very severe, very seldom fatal, especially in Bethel. Had some bad cases in Norway (Bear River) ten or twelve years ago. I am informed that about the year 1861 or 1862, a severe epidemic prevailed in the lower part of Bethel. It originated in a case imported from Boston, was very fatal, and not much amenable to treatment. I think that sufficient notice is not taken of the part that *dogs and cats* play in the spread of contagious diseases, especially small-pox, scarlet fever, diphtheria and typhoid fever. I am firmly of the opinion that many mysterious cases originate in this source. These animals have free access to children sick with the above diseases and they prowl for miles from home carrying the poison germs in their hair, and in their plays and fights communicate it to other animals who convey it into families, and are caressed and handled by children, and they become victims to those diseases and people are at loss to know how they became thus affected.

Of **Typhoid Fever** I have had only occasionally a case, sporadic. One remarkable case was imported (called the "ship fever") by a sailor; every one in the family took it and perhaps one watcher; the sailor recovered, but three died. Its spread was stopped by burning all bedding, rags and clothing used about patients and thoroughly fumigating the house with tar, sulphur, etc. About fifty-eight or sixty years ago a remarkably malignant and fatal type of typhoid prevailed in the town of Newry, along the Bear River, hence called the "Bear River fever." This outbreak had its origin either in some bad condition of water or premises, or, as some thought at the time, in atmospheric causes. From whatever source, it rapidly invaded nearly every family and proved highly contagious, all coming in contact as nurses or watchers either taking the disease or having most of its symptoms. It was very fatal; raged from one summer till a year from the next fall.

Cases of **Phthisis** are not frequent. The causes are many, but I would particularize hereditary transmission as first, and damp, cold, ill-conditioned and ill-ventilated houses as second in importance, especially in early life.

The faults in our **School-Houses** are in the direction of the heating, ventilating and construction of water-closets or privies. I think I have had cases of croup, diphtheria, pneumonia, pleurisy, and occasionally and quite frequently catarrhs, from faulty heating and ventilating. Headache troubles much.

Biddeford—Fred Bacon, M. D.

Consumption and fevers, rheumatism and zymotic diseases are the more frequent diseases. Diphtheria was here to a great extent the latter part of last year. I had a number of cases with but few deaths. Small-pox once in the past six years, from Canada; cost $2000. Phthisis is quite common, due largely to want of ventilation and occurring mostly among the foreign residents. With the other classes much is due to dampness and exposure.

I should say that the principal fault with **School-Houses** is that they are not well ventilated. Much headache. I know of one school-house from which I have had more children sick than from any other. Some children going from other localities into that have been troubled more with sickness than they were in other places.

Biddeford—S. J. Bassford, M. D.

The prevailing diseases in this city are typhoid fever, diphtheria, pneumonia, bronchitis, phthisis pulmonalis and tonsillitis. I mention the last four diseases as I have observed that our climate is such as to cause more than an average of these diseases.

I have lived in Biddeford four years. In the winter of 1883 and 1884 occurred an epidemic of **Scarlet Fever.** The disease existed at Old Orchard. A lady and her child went to Biddeford Pool from Old Orchard, and on the journey (a distance of 13 miles) she stopped with friends. A few days after, the children in the family where she called were attacked with scarlet fever and about the same time a child in the family at Biddeford Pool where she stopped was taken sick with the same disease.

A large number of cases occurred in the village, some of which were quite severe. Only one death occurred. There were a few cases, perhaps a dozen, in this city proper soon after, and four or five deaths occurred. The mother of the child from Old Orchard was positive that her child had not had scarlet fever, although he had not been well for two or three days. If he had not, the contagion was communicated by means of clothing. One family, (mother and three children) had scarlet fever here in Biddeford last fall. They were separated from communication with friends and neighbors, and no other cases occurred. Where the fever came from I do not know. No other cases have occurred since my residence here.

Four years ago, **Typhoid Fever** raged here, and a great many deaths occurred, especially in one part of our city, where plenty of filth existed, together with crowded tenements, poor water and bad drainage. There were quite a number of cases here two years ago. Only a few last year. We have some typhoid fever every year. The conditions are very favorable for that and diphtheria, due to wet cellars, poor drainage and door-yard privies.

Last year, winter of 1884 and 1885, occurred the only epidemic of **Diphtheria** since my residence here. There were about 55 cases, 15 deaths. The majority of cases were light, some were very severe and terminated quickly.

Small-Pox has visited us but once since my residence here, in the winter of 1882 and 1883. I believe that the **Scarlet Fever** poison is very active under any condition, but it is increased by unsanitary conditions. I think that nearly all my cases of scarlet fever were due to infection derived from other cases. Do not know about the first case at Biddeford Pool, or the family here last fall. Am not positive about this.

Much, in the causation of **Diphtheria,** in my opinion, was due to defective drainage and wet cellars; could trace no other cause in some cases. I know of one severe case which arose from opening a sink drain where filth had accumulated. Most of the fifty-five cases here last winter were in the parts of our city which were the highest in location. School-houses and dwellings are there built on the ledges, so famous here; drainage was deficient, water remained in cellars and under buildings, and the result was disease and death to the inhabitants. I was called to make one visit to a little girl sick with diphtheria (in absence of her physician). Found that hemorrhage existed, caused by the separation of false membrane from the nostrils. The case was a severe one. I controlled the hemorrhage by compressing the artery for ten or fifteen minutes; then I cleansed the face with carbolized water, and after thoroughly cleansing my hands I left the patient. In six days I was attacked with the disease. I was attending several cases at the time, but from this one I believe I took the disease. The epidemic last winter was spread through the schools, and schools were closed here on that account.

Typhoid Fever has appeared here in families who used water from the same well; and I have no doubt that the water was polluted. The pollution was from privy and barn-yard. Have known of localities where typhoid has recurred in successive seasons. Have thought it came from pollution of well water, in some cases from privies. Know of one tenement where the fever is a regular visitor. Water from sink drain stands under the house. There is no cellar. One case seemed to be caused by milk furnished by a family where typhoid had existed. I was watching some workmen near a shed in this city two years ago, and, when using a pick, one man dislodged a stone which proved to be a part of a drain from a privy vault which was obstructed. As soon as the stone was moved there boiled up the most offensive, black liquid This flowed across the lane in front of a large tenement house, producing a very disagreeable odor in that vicinity. Ten or twelve days later I was called to a case of typhoid fever in this tenement house; other cases followed, due to the filth which rolled before the door a few days previous.

Climate more than anything else is the cause of **Phthisis** in this section. Climate here is very changeable. Part of some days we have very warm and dry, and before night a "sea turn" sets in and the evening will be damp and cool. Being so near the sea we are subject to very great and sudden changes in temperature, and catarrhal, bronchial and pulmonary difficulties are numerous. But a small part in the causation of this disease is due to imperfect ventilation. Very much to dampness. I think our damp atmosphere causes a large part of our cases. I meet often with cases which prove to me that this disease is hereditary. Out of a large family of children in this city, five or six have died within as many years, all from phthisis pulmonalis. Other members of the same family, from present indications, have the seeds of the disease about them.

A lady called to consult me last week who has phthisis. She says she was perfectly well until her husband died a few months ago of quick consumption. Since the death of her husband she has gradually failed. She slept with and cared for her husband during his illness, and the case seems to be one of many to prove the infectiousness of phthisis.

The most common faults in the **School-Houses** in this city are in the ventilation and arrangements for heating. Think some cases of diphtheria have come from unsanitary condition of our school-houses. I can think of some cases in particular which seem to prove this. The average attendance of pupils is 93 per cent. Of the balance of 7 per cent, I should think that 5 per cent was on account of sickness and 2 per cent for other causes. Headache is a frequent complaint. If a case of scarlet fever or diphtheria were found in the school nothing would be done except to close the schools if cases were very numerous. Some teachers use various disinfectants of their own accord. A good board of health would find a grand field for work here. We need more thorough work here in this direction. Some particular school-houses have been noted for unhealthfulness. We have a school-house on Fose Street, one story; two departments. It stands on high ground but ledgy. It is very damp, I am informed. I have noticed that in times of epidemics more children from that school are attacked than from any other. This I have attributed to the dampness of the place. Another such school-house existed on Wentworth Street, but has been removed, and a good building built in its place. A member of our school board lost a little girl by diphtheria. He always thought it was caused by the unsanitary condition on Wentworth Street or rather connected with that school.

Biddeford—A. BRAWN, M. D.

We have had **Small-Pox** four times during the last fifteen years. The first time it came from Boston in the fall and winter of 1872–3, probably costing the city $600.00. The second time it was brought from Canada in the summer of 1874. There were four cases and it cost the city $300.00. The third time it came from Canada in the winter of 1878; there were twelve cases and it cost the city nearly $3,000.00. The fourth and last time it came from Canada in the fall and winter of 1881–2. We had 44 cases and it cost the city nearly $7,000.00.

Diphtheria is not very prevalent. The causes have seemed to be contagion and bad sanitary conditions. In 1880 there were quite a number of cases in a certain part of the city, all, or nearly all, of which were in some way connected with the schools in one school-house and on investigating we found the school-house on a high and apparently dry piece of land or ledge, but directly under the house, in a basin formed in the ledge, we found a pool of stagnant water. This being removed and the school closed for a short time the disease abated. My opinion was that the dampness and unhealthy effluvia arising from this pool had something to do in causing the disease, and contagion might have helped continue it. I have known cases where I thought diphtheria was spread by *public funerals.* One instance I recollect where a child was carried to a funeral and in a week, or less than a week, the child was taken down with the disease.

In the summer and fall of 1880 I was called, in attending to my duties as City Physician, to attend a family where four persons had **Typhoid Fever.** On investigating, I found, a few rods from the street on the opposite side in an open lot, a well of water. This lot was nearly surrounded with houses and on three sides the ground descended from buildings to the well. On inquiry I found that people in that vicinity considered the water bad and did not use it, but this family had lately moved there and did not know it and procured their water at this well. There were no other cases in the immediate vicinity. I thought this water might have been the cause of the fever. In the summer of 1881, in another thickly settled part of the city, we found ten cases very near each other, and we found every family that had the fever had been using water from a certain well in the street, and that families that did not use this water did not have the disease. The water was not examined, but the using of it stopped and the fever abated.

Cases of **Phthisis** are quite frequent. The most frequent cause is hereditary tendency, while bad ventilation and dampness are both strong exciting causes. I think, also, that bad school-house ventilation has very much to do in causing it. The question of contagion and heredity calls to mind one family that came under my observation some years ago in which the husband and father was sick a long time with consumption and his wife slept with him until very near the last. There was no appearance of a consumptive tendency in the wife until about the time he died, when symptoms of the disease began to develop and in a short time she died. There was quite a large family of children all but two of whom died with the disease soon after reaching adult age. I think the wife took the disease from the husband.

Our **School-Houses** are badly heated and ventilated. I know one teacher that had the headache a large part of the time during school hours while teaching in a certain school-room during the season when the room had to be heated. I have no doubt it was caused mostly from the manner of heating, and poor ventilation.

Biddeford—JAMES SAWYER, M. D.

Typhoid Fever prevailed to an alarming degree from 1848 to 1853. Then new streets were being opened, extensive excavations made for canals, the foundations for mills, etc. Hundreds of common laborers were crowded into tenement houses, ill ventilated and unwholesome from the sink washings being allowed to spread upon the surface of the ground in the rear of many houses. With the beginning and developing of a good system of sewerage the frequency and fatality of the disease has decreased. It occasionally appears as an endemic, and generally the causes are traced out and located. In 1881 it invaded a short street about four hundred feet in length in the center of the city. The result was twenty-eight cases. Investigation proved beyond a reasonable doubt that the cause in this instance was from having drawn their supply of water from an old well in the rear of one of the houses on this street, which was contaminated with the surface washings from a stable and filthy back yards. The pump was removed and the well closed. Last autumn, in a block of tenement houses in an adjoining street, occupied by French Canadians, typhoid fever appeared and upon investigation it was found that these people had gained access to the above-mentioned well, using the water for domestic and drinking purposes. When in 1849 the cholera was epidemic in this country, the disease made its appearance in our town. There were five or six fatal cases. Diarrhœa and dysentery prevailed at that time.

Have in mind three cases of **Scarlet Fever** in one family in the country where the contagion was pretty certainly communicated by means of another child's clothing who had had the fever six weeks previously. There were no other cases in this neighborhood.

Diphtheria occasionally makes its appearance. In 1884 it made its appearance as an epidemic, was confined within the limits of a narrow section in the southern part of the town which at that time was defective in common sewers, consequently the soil in many places remained full of water through the hot season, becoming stagnant in many places. In one house there occurred two deaths. The well from which their supply of water came was near the house, the surroundings on a level, consequently the surface wash or much of it went into the well. I may here say that the present year this locality has been greatly improved by the extension of sewers through those wet places; also the water supply company have extended supply pipes through all of the streets.

I had five cases of **Typhoid Fever** in a family of six members, consisting of a man and wife with four children. House situated in the country one-half mile from the ocean, upon a little elevation.

The surroundings healthy with the exception of the ground under a back window where the washings from a sink had been allowed to stand uncovered through the summer months. There was no other case of typhoid in that neighborhood. Undoubtedly the fever in these cases was caused by noxious gases emanating from the sink drainage in the rear of this house.

Previous to the year 1876 sporadic cases of **Small-Pox** occurred several times (six or eight). In 1876 it broke out in a French family, one of whose members, just from Canada, being the first victim. There resulted four cases and two deaths. In 1881 the disease invaded our town via Canada, resulting in forty-four cases and five deaths. Cost the city $3,200 exclusive of the expense of a new pest-house. The following year it was again introduced by a French Canadian. Nine cases this time. Cost to the city $1100.

The precautions which are enforced when a case of scarlet fever or diphtheria is found in a **School-Room** are exclusion of the pupil with others of the same family. A physician's certificate is required when they return to the school. If many cases appeared in the same room that school would be closed until the distemper subsided.

Boothbay—ALDEN BLOSSOM, M. D.

There have been thirty deaths in town during the present year and nine have been from pulmonary consumption. **Small-Pox** has invaded the town four times in forty years. Total cost, $1,000.00.

One family retained the contagion of **Scarlet Fever** in hair and clothing so as to carry it five miles six weeks after they went out. About one-half my cases were due to infection derived from other cases.

Diphtheria has never prevailed here as an epidemic. I think the more frequent cause is from taking cold.

Cases of **Pulmonary Phthisis** are frequent. One-fourth of the deaths are caused by this disease. In my opinion the most frequent cause is heredity.

The most common fault in the **School-Houses** in this town is poor ventilation. If a case of scarlet fever or diphtheria were found in the school-room, the patient would be kept from school as long as any danger existed.

Boothbay—J. A. Carter, M. D.

We encounter about the same diseases in this vicinity as occur in other places; yet to me it is very evident that many of the non-contagious acute diseases do not occur nearly as often or in so malignant a form as in many other vicinities in the State. In the spring we have a few cases of pneumonia, not many compared with most inland towns, and I can say the same of summer and autumn complaints, cholera infantum, typhoid fever, etc. The acute diseases which are the most common are of the catarrhal character, influenzas, etc., which are quite prevalent in the winter and spring. Absence, and not prevalence, constitutes the principle peculiarity of diseases in this vicinity. The comparative non-prevalence of acute and some chronic diseases, for instance, of the entire exemption from spinal irritation, or rachialgitis, of which in the vicinity of my former practice I met with cases fully marked and very obstinate very often. At one time, in Lewiston, Webster, Greene and Wales, it constituted more than one-half my chronic cases, while twenty-two years in this vicinity has failed to discover a single case. I cannot discover the cause, but it is quite to my mind that Georgetown is visited more frequently with scarlet fever than Boothbay. I cannot say that it does not appear here epidemically as often as in most other small towns, perhaps once in six, eight or ten years. Diphtheria has appeared in this town but once epidemically for twenty-two years. There have been quite a number of sporadic cases, some of which were very sudden and fatal, and as inexplicable as sudden. In one instance, two young ladies twelve or fourteen years of age, sisters, of a neat, careful family in comfortable circumstances, sickened and died, both in forty-eight hours from the onset of the first symptom.

I have had some experience with **Scarlet Fever** and quite early in my practice came to regard it as one of the most readily contagious diseases of any with which we have to contend, as well as one which demands scrupulous care to prevent its spread.

In my early practice near Lewiston, a lady with her little boy came to the place to visit her mother. While there a little child in one of her father's tenement houses was sick with scarlet fever. The lady's mother called to see the child quite often and, as was then not considered necessary, took no precautions against taking the germs home to the little grandson, and so the boy took the complaint but luckily had a mild run. To avoid a relapse, by my advice they did not return to Portland until the lapse of six weeks from the time he was better; yet, notwithstanding the length of time and scrupulous care, they carried it home and from their house in Portland it spread in the form of a malignant epidemic.

I was called to Barter's Island to see a little child but a few days old dying of this disease, besides which there were no cases in that vicinity; but a young lady who was just convalescing from an attack which she had at her home in Wiscasset before coming there had been with them several days before the child was taken.

Last May, the children of a very poor family, as well as a very ignorant one, had scarlet fever while there were no other cases in the town before nor after. On inquiry the neighbors informed me that the foolish people had, a few days before the children were taken sick, purchased some old clothes which no doubt contained the germs.

One very convincing case occurred in the same vicinity as the above. A child about one year old died of scarlet fever, and after cleansing the cradle blankets in what cleanly people then considered a suitable manner they were laid away in a drawer where they remained four years undisturbed, at the expiration of which time there was another little boy in the cradle and the blankets had been brought out for its use, but in a few days this also sickened and died of the same disease. Where did it come from? There were no other cases to be heard of, nor had there been for years. Then where could it come from but from the blankets? Now if the germs will live four years who can say how long they will not live or in what situations.

Consumption is dependent very much on the habits of the people; especially it is very often caused in ladies by insufficient protection to the feet, for instance, going to evening entertainments and sitting with feet and ankles wet and cold. The first cause I should say is hereditary predisposition, and the second potent cause contagion coming usually from ignorant indifference to the disposition of the sputa of phthisical patients. Bad ventilation holds some part in the work, while over-study combined with anxiety on the part of young ladies away from home at school has destroyed thousands.

Our **School-Houses** need ventilation. Many are not properly heated, and, when too warm, windows are let down and the children take cold.

Bowdoinham—I. C. Irish, m. d.

There are no special prevailing diseases confined to this town. The most common are consumption, bronchitis, tonsilitis, diphtheria, fevers and rheumatism. In the winter of 1878-79 a severe epidemic of diphtheria prevailed in this town, mostly confined to Bowdoinham Village. There were in all about twenty-five cases, and of these, eighteen or twenty died. Tonsilitis (follicular) occurs quite often in this town as an epidemic. Small-pox occurred about twelve or fifteen years ago, but it was limited to a single case.

Quite recently I had a case of **Scarlet Fever**; a boy about five or six years of age. It was probably brought to him by a young lady who lived in another part of the town, who spent the night with this boy's family. She had been around cases of scarlet fever and was around the boy playing with him. Not long after this he was taken sick with the disease.

In my opinion, scarlet fever, when brought into a community, is more liable to spread in a dirty and filthy neighborhood than in a clean one, though the special factor in the case is specific poison.

In the epidemic of **Diphtheria** which prevailed here in 1878-79 no means at all were taken to prevent the spread of the disease and in two or three months twenty persons who had the disease died.

Two or three years ago I had a case of **Typhoid Fever** in the village. It was not a very severe one and after about three weeks sickness the patient recovered. Now I have another case in the same family and on inspecting the premises carefully I find an old privy which is perhaps partially cleaned out once a year, and within 20 or 25 feet a well which supplies the drinking water for the family. The privy and well are both under an old shed which is filled with all kinds of filth and rubbish. Perhaps this may account for the fever in the family, but as yet I have not had the water analyzed.

A year ago last fall typhoid fever prevailed to the extent of a dozen cases. In one family two girls about twelve and fifteen years of age were taken sick with it. I carefully examined the premises and found the well within fifteen or twenty feet of the privy, and on the other side of the well from the privy there was a bog hole of stagnant water, perhaps 20 or 25 feet long and 15 wide; the well was about 18 or 20 feet deep, the last 4 or 6 feet being in a ledge. The soil about the well was light and porous. The girls alone had used water out of the well. There was but very little water in it, as that fall there was a short dry spell lasting for a couple of months. I did not have the water examined but the facts are certainly suggestive.

In my experience the farmers and other people living in our small village are more careless about their houses than any other one thing. The privies are generally nothing but a hole in the ground, covered with a light frame building, and the deposit, no matter how near it may be to the well or cisterns, is allowed to remain for years, sometimes, and the stench in warm weather is terribly intolerable.

Phthisis is quite frequent. The principal cause is heredity. Frequent and extreme changes in the weather and dampness and poor ventilation undoubtedly play quite an important part in the causation of the disease.

The methods of lighting, heating and ventilating the **School-Houses** are faulty.

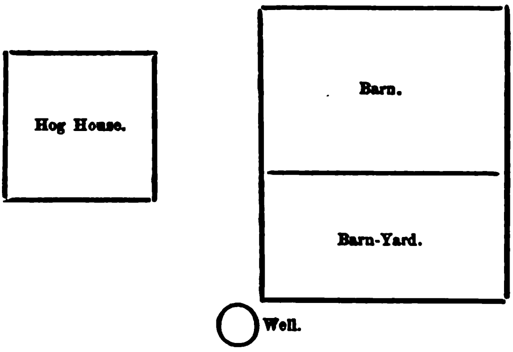
Brewer—L. H. Wheeler, M. D.

The more frequent diseases are diphtheria, typhoid fever, and pulmonary diseases. An epidemic of diphtheria existed here seven or eight years ago and was confined to the French population. Since that time the disease has been endemic in its nature.

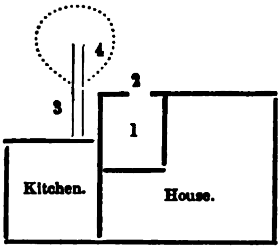
I have not seen or heard of a case of **Scarlet Fever** in town since I have been in practice here.

Diphtheria has been quite prevalent here. The cause of this disease in the majority of cases has been poor drainage, foul sink drains, impure water, etc. While a workman was repairing a foul sink drain, some of the fumes escaped into a room in which a lady was at work. In three days she had an attack of diphtheria. In another case, a boy, on a warm afternoon in March, chopped some melting ice on which the sink spout had been discharging during the winter. In two or three days he had a severe attack of diphtheria. Isolation having been practiced, there has been no spread of the disease through our schools.

An employe on a steamer which took its water supply from the river, a few rods below where a large sewer from the city of Bangor discharged itself into the river, had a severe attack of **Typhoid Fever**. This water was carried in the tanks until it became "thick." The following pen sketch represents farm buildings in which recurred cases of typhoid fever, in two successive seasons. The water contained a large amount of drainage matter, and the odor from the pool at the end of the sink spout was very offensive.



1, Patient's Sleeping Room.
2, Window to same.
3, Sink Spout.
4, Pool of Water from Sink Spout.



Faults existing in our School-Houses are improper heating, insufficient ventilation and impure water supply. In many of the school-houses the chief method of ventilation is by the windows and doors. Five to eight per cent of sickness. Headaches are complained of much. Isolation of the cases and probably the cleansing of the schools would be enforced if scarlet fever or diphtheria should gain access to the schools.

Bridgton—J. B. BRAY, M. D.

The prevailing diseases are lung and bilious fevers at this season. There is very little scarlet fever, diphtheria or typhoid fever in this place. I have seen but few cases in ten years. Small-pox has invaded this town but once, nearly twenty years ago.

In cases of **Scarlet Fever**, I think the cleaner the surroundings, the lighter the fever. My experience is, that it goes through a family as a rule.

My opinion is that **Diphtheria**, the same as scarlet fever, is caused by contagion.

I have noticed cases of **Typhoid Fever** which seemed to be caused by the pollution of water by sink drains, cess-pools, etc. The only severe case of fever was from this cause, and occurred in the fall of 1880.

I have known of cases of **Phthisis** which were caused by unsanitary conditions, but have been unable to see infection in this disease.

School-Houses are new and good in this town; and the percentage of pupils absent on account of sickness is very small.

Brooks—J. T. Collier, M. D.

The prevailing diseases are colds, pneumonia, typhoid fever and diphtheria.

Diphtheria has prevailed more or less for twenty-six years. Causes very often from privies.

Cases of **Typhoid Fever** have occurred as the result of polluted water.

Cases of **Phthisis** are not very frequent. As causes I would mention bad colds with predisposition to the disease.

Our **School-Houses** are troubled with draughts through the floor, the buildings not being banked up, and in many the only means of ventilation is by raising the windows from the bottom, thus exposing the scholars to draughts. Ten per cent on the sick list. Headache is common.

Brooks—Geo. H. Libby, M. D.

I have had perhaps fifteen or twenty cases of **Scarlet Fever** but have always confined it to the house in which it appeared. I could not find any possible way of their getting it other than by infected clothing. They made sale work in all of the places except one and in that one they had the post office. These cases occurred in different years and in different localities. We have had no epidemics of **Diphtheria** in this town but have had in Monson and Knox. We had quite an epidemic of **Typhoid Fever** here in 1875-76. The discharges from the earlier patients were not promptly removed from the rooms nor disinfected, and as a result it spread through whole neighborhoods and I think that the second year's epidemic was caused by the poison from the patients of the year before. As fast as I was called to attend the cases I had the stools put into the ground in some safe place and all soiled clothing removed and disinfected at once. Since then we have had isolated cases but no epidemics.

Brownfield—W. L. GATCHELL, M. D.

I think lung troubles rather predominate among the prevailing diseases. No cases of scarlet fever in the three years that I have been here. Two cases of diphtheria in that time, one fatal. About a dozen cases of typhoid fever a year on an average. They have occurred almost wholly on the farms. No cases in this village since my stay. Said to have been very prevalent years ago. Water obtained at that time from wells. Village is almost wholly supplied now from fountains dug in mountain back of village.

A large proportion of deaths in my practice has been from **Phthisis**. It occurs most notably in this town on the shores of Shepherd's River, a small stream having meadows and intervale along its banks. The disease being so common, we can appear to trace heredity in a good share of cases, but it may not be the real cause after all.

Our **School-Houses** have imperfect ventilation, hard seats and improper lighting.

Bryant's Pond—C. B. RANKIN, M. D.

No special disease prevails in this locality. **Scarlet Fever** was in this section about ten years ago and has not appeared since. **Diphtheria** was in this village in the spring of 1883; there were about ten cases, with three deaths, all children. The cause of the disease I am unable to state positively, but I think it was from bad drainage where it started. In my field of practice **Typhoid Fever** is a rare disease; I have had only one case in nearly three years and there have been no others to my knowledge in this locality. Dr. Sawyer, who was here five or six years before me, saw typhoid in only one family during that time. The case of typhoid referred to was on a high hill in Milton Plantation in one of the healthiest spots in this part of the country. The cause of the disease I was unable to find. It is reported that there was a case of small-pox in this town about twelve years ago; it cost the town about $150; it did not spread. They claimed the disease was contracted from rags.

Phthisis is quite common about here; most of the cases which have come under my observation have resulted from measles or some former lung trouble; a family tendency could be traced in all.

Of the **School-Houses** I can only say words of praise; they are nearly all new in town and most of them have been built with special reference to comfort and good sanitary conditions. If any contagious disease should break out here in the schools they would be immediately stopped, as we have recently seen when the measles appeared in town.

Buckfield—A. C. Whitman, M. D.

Amongst our diseases there recur quite often in this place fevers, rheumatism and pneumonia. We have had no cases of small-pox for twenty-five years.

We have not much **Diphtheria**. Cases recur more frequently, and are oftener fatal, among those in an unhealthy state and those who disregard sanitary conditions.

I have known of many cases of **Typhoid Fever** coming from such unhealthy conditions as are covered by your enquiries, and I also have seen recurrences in successive seasons in some houses.

Phthisis occurs not so frequently as in some other localities.

Our **Schools** have poor ventilation and defective heating. Much headache. I know of one school-house which was particularly unhealthy. The privy had not been cleaned out for years and the stench was so strong in summer as to preclude raising of windows.

Bucksport—Geo. H. Emerson, M. D.

The prevailing diseases are phthisis, pneumonia, bronchitis, rheumatism and typhoid fever. There has been no epidemic of scarlet fever, diphtheria or typhoid fever during the last ten years. Small-pox has been brought by seamen on incoming vessels.

Have seen a number of cases where the origin of **Scarlet Fever** must have been from infected clothing. Have seen two cases in a family where two years before there was one child sick with it. Investigating closely, I am led to believe that these two last received the contagion from clothing worn by the first child two years before, and which had been put away.

Diphtheria has been very infrequent in this locality. The most of the cases have been among the poor—large families living in small unventilated rooms.

From that I judge that bad hygienic conditions favor the development of the disease.

In nearly every case of **Typhoid Fever**, it seems to me, I have been able to demonstrate the probable cause from the contamination of drinking water by cess-pools, sink drains or privy vaults; or by effluvia from decaying vegetables in cellars, from cess-pools and the like—and on board vessels from bilge-water.

Cases of **Pulmonary Phthisis** are very frequent in this part of the State. In-door life, and necessarily imperfect ventilation are the more frequent causes of this disease, as no regard to ventilation is given in the most of our buildings. I do not think dampness alone is much of a factor in the causation of phthisis, but am well persuaded that the subjects of chronic phthisis have been passing the greater part of their time in unventilated rooms previous to their illness.

With reference to the causation of **Phthisis** by unsanitary conditions, I would give the following cases as so caused: Two men, of the ages 36 and 42, respectively, not relatives, robust, vigorous, and without family histories of tubercle or scrofula, accustomed to out-of-doors life, went three years ago to work in a certain room, and lived at a certain house, though not rooming together. One died a year ago from chronic phthisis, the other is likely to die within a few months from the same disease.

The most common faults in the **School-Houses** in this town are poor construction and insufficient attention paid to light and ventilation. Illness is frequently caused by faulty ventilation of schoolrooms. Headache is frequent.

Buxton—F. A. SOUTHWICK, M. D.

There have been no extensive epidemics since I have been here. Small-pox occurred once, upwards of thirty years ago.

Mrs. G., with her child, visited friends in Massachusetts in 1881. **Scarlet Fever** had been in this family some few months before. Two weeks after reaching home the child was taken sick with scarlet fever. To her knowledge there was no other possible exposure. I think this disease would be more likely to rage in small and filthy apartments. I believe that nearly, if not quite, all cases of scarlet fever are caused by infection. The two following cases are given as illustrating the treacherous nature of scarlet fever and some of the ways in which this disease may suddenly lead to a fatal termination, even in what have appeared to be only mild cases.

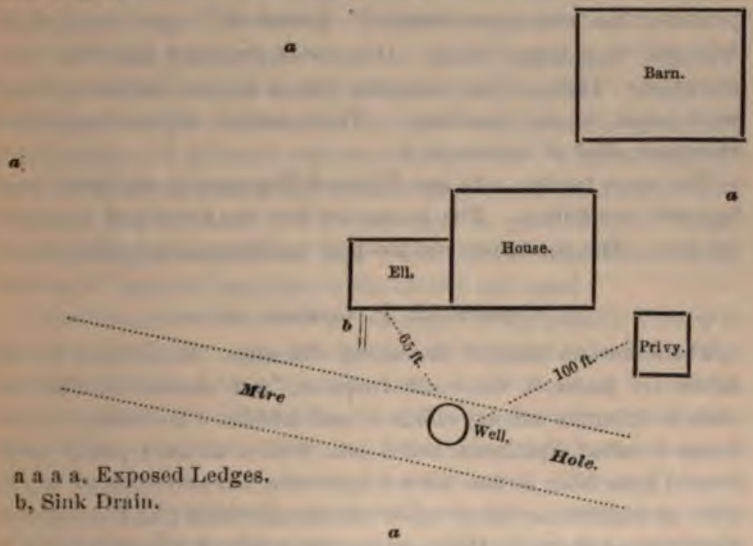
Miss G., aged ten years, (same child as referred to above) went through the several stages and began to convalesce; was allowed to sit up two or three hours during the day without my permission. The night following she was taken suddenly and violently worse; throat sore, maxillary glands enlarged and painful. A messenger came for me, but she grew rapidly worse and died before I reached her, in less than three hours after the change began. No peculiar appearance about her after death.

Eddie H., aged six years, exposed by being with cases of mild scarlet fever. In the third week following I was called to see him. Found him about the house, countenance good, no eruption and saying that he felt well. On examination I found temperature 104, pulse 140, maxillary glands and tonsils enlarged, urine scanty and bloody. At my next visit I was told that mortification had taken place. On inspecting the legs I found both thighs as black as charcoal. Had consultation at once; decided child must die. He did in six hours after and in his last hours considerable eruption appeared on hands.

There is not much **Diphtheria** here now. Conditions which favor the disease are, too small or ill-ventilated rooms, damp cellars, stagnant water or swamp land around. One family, consisting of five children, all had diphtheria in winter of 1882-83, also the same ones in winter of 1883-84. It began each year with the youngest and one by one came down until it went through the family. The house is made of brick and stands in immediate proximity to a pond. Diphtheria has appeared in two other families near this pond since I have been in town. I have had but one death, and at my request the remains were buried privately at once.

Typhoid Fever is quite a rare disease for this vicinity. I have had but four well-marked cases. Two were in children, both of one family and mild in type. On investigation I concluded they were both contracted from a pond of stagnant water in which they frequently played during the drouth of last August. Another occurred in July, 1883, of tremendous severity, and I am satisfied was contratced by means of sink drain. No case had formerly been in this house. Sink spout emptied within ten feet of well.

The water was of poor quality and under the microscope was found to be filled with animalcules. The fourth case occurred in July, 1881. This will bear a fuller description. J. J., Jr., aged twenty, contracted typhoid fever while at work in Biddeford during the epidemic of typhoid there in the summer of 1881. He came to his father's home early in the course of the disease. He did not take his bed but kept about and used the family privy. Had diarrhœa all this time. He did not call a physician until the twentieth day, when he was taken suddenly worse. He was found already in a state of collapse from perforation of intestine. Two weeks later his father, J. J., aged forty-five, came down with the same disease, which ran a violent course and terminated in death on the twenty-second day. The house in which these cases occurred is situated at the beginning of an ascent of ground and upon a ledge. Back of the house the descent is quite steep for a few feet to a mire-hole beyond which it again rises. In this hollow or mire-hole is located the well at a distance of about sixty-five feet from the house and about one hundred feet from the privy. The back door and sink spout are the nearest points of the house to the well and from these are poured all the slops of the house. The following pen sketch will help to understand the relative positions of house, well and out-houses:



a a a a. Exposed Ledges.
b, Sink Drain.

It will be seen that the arrangements were such that the westerly breezes might waft the poisonous vapors from the privy to the house, and that the well might have the benefit of the soakage from both the privy and the sink spout. Undoubtedly the typhoid fever germs in the discharges of the former patient found their way from privy or slop hole at back door, or both, to the well and were the cause of the father's illness and death.

Phthisis is quite common. In my opinion heredity heads the list of causes. Imperfect resolution after pneumonia is a frequent cause, as is also overwork and improper care of the body. Both imperfect ventilation and dampness act as causes in an already predisposed patient, and it certainly looks reasonable that the bad ventilation of school-houses may act in the same way. Of fourteen cases treated, ten have belonged to consumptive families. Of the remaining four, two followed after pneumonia from imperfect resolution, and two from overwork, frequent child-bearing and exposures. The following cases show hereditary transmission of the tendency to consumption:

Hattie B., aged twenty-five, died of pulmonary tuberculosis. Mother, maternal grandfather and grandmother all died of consumption. Samuel and Daniel C., brothers, both died of pulmonary tuberculosis, aged thirty-five and thirty-eight; their father, with some two or three sisters, died of same disease. Miss A. D., aged twenty-seven; father died of consumption, also three of her sisters preceded her with same disease. Albert H., aged twenty-four, belonged to a large family. One sister preceded him with consumption. Three of the remaining sisters and one brother all have weak lungs, to my knowledge. Their mother, with a long line of ancestors, died of consumption.

The worst trouble with our **School-Houses** is the faulty heating and ventilation. The rooms are also too small and especially too low. The out-houses are too near and improperly cared for.

Camden—J. P. Cowles, M. D.

There are no marked prevailing diseases. Pneumonia among adults is, perhaps, the most frequent, and cholera morbus and cholera infantum among children and infants. Too often a sore throat is called diphtheria and a mild bilious attack typhoid fever. Since I have been in this town I have seen but two cases of a pure type of diphtheria; three cases of typhoid fever; and no case of scarlet fever, although Rockport has the credit of a large number of cases of each. I have had only one case of typhoid-pneumonia.

None of the above cases were epidemic. There has been an epidemic of measles and one of whooping-cough since my residence in Camden. I think there has been but one case of small-pox within the last fifteen years. A year or two prior to 1870 there were several cases of the disease. In the cases of 1868 a sailor brought it here.

In my experience with **Scarlet Fever** before coming to Camden, it has appeared as an epidemic and proved the most serious where there were the most open sink spouts and privies. But few of my cases were due to infection.

Experience has led me to believe that **Diphtheria** is not a contagious disease. I have never known it to spread through schools by means of contagion.

Phthisis is not very frequent. In my opinion the cause of this disease is physiological incompatibility in parents. But a very small part in the causation of this disease is due to imperfect ventilation or dampness. These are the causes or aggravation of other diseases.

Our **School-Houses** have bad seats and desks. The heating is unequal. There is a great increase in near-sightedness among the pupils. Headache is frequent.

Camden—O. W. Stone, M. D.

In the back part of the town we have pneumonia, influenza, some typhoid and simple fevers, catarrhal troubles, etc. Nearer the coast we do not get many fevers, but more lung troubles, pulmonary consumption and croupous affections in children. I have seen two cases of membraneous croup in our village within six months, both of which proved fatal. We also have a good deal of tubercular meningitis in children; and I will not fail to mention a large number of cases of apoplexy in the elderly and aged.

There has never been a severe epidemic of **Typhoid Fever** in the town that I can learn of after careful enquiry. In this village in 1856-57 there were a few mild cases, some of which were fatal. It might be called a mild epidemic, and went through several families. Since that time there has been occasionally a case; one or two a year, perhaps, scattered over the town. The only severe epidemic of **Diphtheria** of which I can learn occurred in 1861, at which time the mortality was great. Since then the cases have been few. No severe epidemic of **Scarlet Fever** has occurred here; occasionally a case. There has been only three cases in the village since I have been here (8 years). Severe epidemic of measles in the spring of 1882, only one fatal case. In 1884 whooping-cough. **Small-Pox** three times. I can give particulars of only two instances, the other I can learn nothing about. In 1826 there were two cases; a stranger came into town sick with it and one child in the family where he stopped took it and died; it stopped there. No cost to the town. In 1864 a young man who had it came home from sea, got a team and went out for a ride. The family of the man of whom he hired the team contracted it from the sleigh robes and from there it spread; there were twenty-five or thirty cases; several died. At that time the cost to the town was $431.76, according to the town records of that year. There was a mild outbreak at another time, of which I cannot learn much.

In my opinion, filthy and unventilated houses, scanty clothing and imperfect food bear a great part in the predisposition to **Diphtheria,** also tuberculous diathesis and anything which lessens vitality and impoverishes the blood. Once developed I think it contagious. I had it myself in 1881. I am sure that I contracted it from a child while making a local application to its throat. In 1879 an epidemic occurred on a small island in our bay, three miles from here (a part of Islesboro'); there were about fifteen families on the island. A child in one of the families was taken with sore throat; on the following day I was sent for and the child died before I reached the island. It had the appearance of diphtheria and I pronounced it such. In a few days another member of the family had it, and also three children in a neighboring family (relatives to the child who died and who were present during her sickness). After that it spread over the whole island; nearly every family had it.

Cases of **Phthisis** are decidedly frequent. As exciting causes I think chief among them are our moist atmosphere and damp soil.

I will say that I think the **School-Houses** in our town are quite satisfactory as a general thing.

Casco—CHAS. H. YOUNG, M. D.

I have known of **Small-Pox** here only once. The disease was supposed to have been contracted in Boston and brought to Casco. It spread and about one dozen persons had the disease including varioloid, but none died, although some of them had the disease in its worst form. All the patients were treated at their homes, none carried to the pest-house. All bills were settled by the families; no expense to the town.

Have had but few cases of **Diphtheria** in our village. Quite a number of cases round about town.

Castine—S. J. WALLACE, M. D., Sec. Board of Health.

In my own experience there is a notable case; during last season, in January, I attended the H—— children who had **Scarlet Fever**, using the usual precautions, as I had two children of my own, the eldest a rather frail boy not six years old. The H—— children made a good recovery, and I had no occasion to call there until the 15th of July.

My book shows that I was there the 15th, 16th, 18th, 22d and 23d, several of the visits quite prolonged. I took no precautions against infection or contagion, not even giving it a thought; yet on the 23d of July, one week from my first call, my boy was taken with scarlet fever; four days later my little girl, three years old, was also taken. Both cases quite severe. I have no doubt that I carried it from the H—— family home to my children, as at the time there was not another case in town. Too great stress cannot be laid upon the importance of the thorough disinfection and fumigation of the rooms and clothing after all cases of infectious and contagious diseases.

Castine—G. A. WHEELER, M. D.

The prevalent diseases are phthisis, bronchial affections, rheumatism and diseases of the nervous system. Carcinomatous affections have been more common than in most places of a similar size. Acute diseases seem to run a milder course than in the adjoining towns. The course of consumption is usually very chronic. Epidemics have uniformly been mild. Scarlet fever has prevailed here five different times within fifteen years, but mild, scarcely a death occurring in any of the epidemics. Diphtheria has occurred twice in that time with eight or ten deaths. Typhoid fever has never originated in this town nor has it been epidemic here. All these diseases have been epidemic in the neighboring towns. There has occurred one case of cerebro-spinal-meningitis within the past year, and pneumonia, which is generally a rare disease, was very frequent here and in adjoining towns last winter and spring, and might almost be considered as epidemic. Small-pox occurred in 1805, 1840 and 1859.

Brought from abroad by seamen, and cost the town some hundreds of dollars. In 1803 a "malignant" disease was brought to town and a quarantine was established. There is nothing to show whether it was small-pox, cholera or yellow fever. In 1832 a quarantine was established on account of **Cholera**, but there were no cases in this immediate vicinity.

Diphtheria has occurred three times in all. The causes are infection either alone or combined with unsanitary conditions. I had one case which I think was carried by clothing. Diphtheria was prevailing in Deer Isle. No cases in Brooksville, Sedgwick, Penobscot or Castine. A young man from Deer Isle who had not had and did not subsequently have the disease, called at a house in Brooksville and took up and played with a babe about one year of age. In a week the babe died of diphtheria. I could see no other way in which it could contract it. We always close the schools on the outbreak of a single case. I think that is one reason why we have suffered so little from it in this town. I have known it to go through certain schools in adjoining towns and attack nearly every scholar. I have not known diphtheria to be spread by public funerals. Here we do not have public funerals in case of any infectious disease.

I had one case of **Typhoid Fever** ten years ago, in the winter, which I was unable to call anything but true enteric fever, which was caused apparently from decaying vegetables in a cellar which had not been cleaned for years.

There is considerable of **Phthisis** caused apparently by hereditary predisposition and reckless disregard of extreme changes of temperature, damp cellars and too greatly shaded houses. A great deal is due also to imperfect ventilation and perhaps an equal amount to dampness.

The principal fault in our **Schools** is the neglect of the condition of the out-houses. About 4 per cent of the pupils are absent on account of sickness.

Charleston—GEORGE D. COOK, M. D.

The prevailing diseases are scarlet fever, typhoid fever, simple fevers, diphtheria and phthisis. There has been no small-pox here since I have known the town. There has not been much of diphtheria. At a time when there was no **Diphtheria** here, a person from this town visited a family where there was diphtheria, some ten miles away, and after coming home had this disease and gave it to the rest of the family. A girl whose home was about two miles distant visited the family that had diphtheria and took the disease herself and gave it to her family, all of whom, five in number, had it. One died from each family. No other cases followed. I have known **Typhoid Fever** to be caused by unsanitary conditions, and the worst epidemic of it I remember seemed to be caused by the cleaning out of an old neglected privy. Those who did the work had the fever first and then communicated it to others.

Cherryfield—C. J. MILLIKEN, M. D.

Whooping-cough is the prevailing disease at present. We had an epidemic of scarlet fever ten years ago; and one of diphtheria from seven to ten years ago, but little since. There has been but little typhoid fever. There was an epidemic of dysentery twenty years ago. There were fifty deaths within a radius of three miles. Small-pox has invaded our town twice. It was brought from away.

Have observed cases of **Scarlet Fever** in which the contagion was pretty certainly communicated by means of clothing. A family removed from a house after having scarlet fever. One year afterward another family moved in and in a few days the children were down with the disease, supposed to have taken it from old pieces of flannel used by former family for bandages. The retention of the vitality of the contagion is shown in this case and in the case of one said to have been contracted from an old shawl after a period of seven years. Unsanitary conditions, I think, have but little to do with the causation of scarlet fever. Nearly or quite all my cases were due to infection derived from other cases.

Diphtheria has been prevalent here. The cause was contagion. It is often contracted by families or children visiting the sick. In one district the disease was spread from the school. Have known of the disease having been spread by public funerals. In one case a child died in a district and was carried to another for burial. The casket was opened and many children viewed the remains. In a short time several cases broke out.

I have noticed cases of **Typhoid Fever** which seemed to be caused by the pollution of water by cess-pools, sink drains, etc., and in some localities the disease has recurred in successive seasons. There was a house in an adjoining town, but within my field of practice, in which the cellar was wet, there being several inches of water on the bottom. The well was within thirty feet of the house. The slops thrown from the window drained into the well, which in wet weather was full to overflowing. There were two cases of typhoid fever in the fall. The next year a young woman, a domestic, who had been in the house but two or three weeks, was taken with the disease and removed to her home, one-half mile. From this case there were seventeen others in succession. In the place where the disease was transplanted this second season the well is thirty or forty feet from back door, in sandy soil, and about fifteen feet deep. Privy I think in barn forty or fifty feet from well. Family not neat and would be likely to throw discharges almost anywhere.

Cases of **Pulmonary Phthisis** are quite frequent here. It is hereditary in the larger proportion of cases. There are many cases where one or both parents have died of the same disease, or it is found somewhere in the family. There is one case now under treatment, of a widow who took nearly the whole care of her husband who died after a sickness of about two years. She belongs to a healthy family and the surroundings are good. She now has the disease herself and I think contracted it from her husband.

Poor ventilation is the most common fault in our **School-Houses**. Whooping-cough is prevailing this season, which has kept many away from school in two districts, but generally the percentage of absence is small. If a case of scarlet fever or diphtheria were found in the schools they would be closed. There is one school-house from which diphtheria spread for a short time.

Damariscotta—ROBERT DIXON, M. D.

About one-seventh of all diseases are phthisis, asthma and bronchial troubles. **Small-Pox** has visited the town twice during the past thirty-five years. The last time some fifteen years ago. No **Yellow Fever** for thirty-five years. Two cases of **Cholera** twenty-five years ago; both died.

Diphtheria prevails more or less, caused usually by filth and bad drainage.

Instances of the recurrence of **Typhoid Fever** in successive years have come under my observation, probably arising from germs of a previous case, and from same filth cause as that in the first case.

Pulmonary Phthisis is quite prevalent, due to heredity, and a moist atmosphere in many cases.

Bad ventilation and imperfect privies are the principal faults in the **School-Houses**, from a sanitary point of view.

The want of sanitary conditions in the modes of living is very marked. The most noticeable is in the care of the household excreta. I have been in the cook-room of a house in spring when the odor from the privy was almost unbearable. While passing two particular residences last summer, the stench from the privies was very offensive in the highway. I was consulted two or three months ago by Mr. D. in regard to continued illness of his children. I found by inspection that the play-house (a semi-workshop) was in close proximity to a privy, also that the drinking water had an unpleasant odor. After these conditions were regulated the sickness ceased.

Danforth—M. L. PORTER, M. D.

Catarrhal and bronchial diseases are the most frequent. An epidemic of diphtheria occurred here six years ago accompanied with scarlatina; it proved very fatal. A slight epidemic of diphtheria occurred in the winter of 1884–85; a few fatal cases.

Diphtheria is quite prevalent in this place. It is caused by exposure and unsanitary conditions. It usually runs through an entire school.

We have very little **Typhoid Fever** in this locality.

Phthisis is quite frequent. The causes are exposure, with improper food and poor ventilation. A great many cases are caused by imperfect ventilation and dampness.

We have large, well-ventilated **School-Rooms**. A small percentage of the pupils is absent on account of sickness. If a case of scarlet fever or diphtheria should occur the school would be closed, the room fumigated and the patient isolated.

Deblois—I. C. DAVIS, M. D.

The prevailing diseases are typhoid fever and lung diseases. **Diphtheria** prevailed here extensively twenty years ago and was very fatal, confined to no particular location and affecting mostly children under fifteen years of age. It made its appearance mostly from June to November. There has been but one instance of disease being conveyed from abroad and that did not admit of classification, seeming to partake in its nature of cholera and typhus, proving fatal in one out of three cases, confined to one town and has not since appeared. Small-pox has appeared but once and then was not attended with much mortality; two deaths to eight cases.

Deer Isle—F. B. FERGUSON, M. D.

Lung diseases and rheumatism prevail in this town. I have had no epidemics for years. Small-pox has invaded the town four times. The disease was brought here from Boston and New York. No cost to the town.

We have not had much **Diphtheria.** Filthy and damp locations seem to cause the disease. I have seen cases resulting from contagion, and have also seen it spread through schools.

Consumption is frequent and seems to be caused by heredity. I think the bad ventilation of school-houses has much to do with causing the disease when there is a predisposition to it.

The principal fault in our **School-Houses** is bad ventilation.

Dennysville—A. R. LINCOLN, M. D.

Catarrhal fever prevailed one year ago. Typhoid fever was very extensive three years ago. We had small-pox in 1872 in Edmunds, and in 1864 in Dennysville and Marion.

Capt. Joseph Hallowell of Edmunds came home about the first of December, 1872, and complained of feeling unwell. I attended him for one week, when small-pox developed itself. His wife and seven children were immediately vaccinated; the children had never been vaccinated; the wife had been vaccinated when a child. The vaccination of one of the children did not take and it had small-pox. The wife's vaccination also failed and she had varioloid; she was nursing a child about six months old and continued to nurse it through her sickness, but the child's vaccination took finely and it and the rest of the children escaped the disease, although they were in and about the sick-room during the whole time.

Two years ago, in Pembroke, I saw a young man whose mother had **Scarlet Fever** in Massachusetts and returned home about three months after the inception. Two weeks after her return her son was taken sick. There had been no disinfecting measures taken with her clothes, some of which were brought home unwashed that were worn when she had scarlatina. Several years ago a girl attended a funeral in an adjoining town and contracted scarlatina from people who had come to the funeral from another town. I find contagion necessary, and of all contagious diseases I think scarlet fever is the most contagious.

I have frequently observed cases of **Typhoid Fever** from causes such as you enquire about. In one case both the privy and the well were in the end of the ell of the house. The ell is twenty feet wide. The privy had a plank box which was removed twice a year; the well was twenty feet deep in a porous, gravelly soil. The family consists of a man and wife and eight children. I have attended every member of the family with typhoid and also several of them with erysipelas; I have also attended five persons who lived in the house as hired men or boarders. All of these were at different times. Lately the cases have ceased, I think on account of the privy being removed.

The **School-Houses** in Dennysville are nearly new and their only fault is want of ventilation. Several years ago catarrh was very frequent among the scholars. I was a school officer and found the apparent cause was in ventilating the rooms by dropping the windows. I had fresh air conductors made of boards leading from the open air to under the stoves, which were large box stoves, and had a hole cut through the floor directly under the stoves and a piece of stove pipe put in with a register or valve in it and fresh air was introduced directly under the stoves so as to be warmed before circulating.

The catarrhal troubles then ceased. The difficulty of keeping an even temperature is a great evil.

Dexter—JOSEPH SPRINGALL, M. D.

Scarlet Fever prevailed for the first time in these parts in 1836. I treated above sixty cases; they all recovered except three. A few years after it prevailed again, being then of a different type and more fatal. We have had **Small-Pox** in our village only once. It was introduced by a lady who came from Boston to Bangor on the steamboat. A man was on the boat sick and she went to see him. After her return she was taken sick at her home; also three children came down with it. When I saw them they would not believe it was small-pox. Soon the grandfather and grandmother were attacked, then a neighboring family caught it, and still they refused to believe it was small-pox. Finally they called in two other doctors, both of whom were of the opinion that it was not small-pox, but they had to believe it at last. About twenty-five cases occurred, all recovered.

At another time, in the winter, I visited a town near Moosehead Lake where there were about sixty cases of small-pox. It was a great mystery how it came to that town. It first broke out at a small tavern very little frequented. The disease at no time had been nearer than Bangor, about sixty miles distant, where it had been in the fall. The mystery was soon solved. At this tavern there had come two negroes, male and female. The negro had had the disease but the woman had not. Finally the negress, after the disease was subdued, said that she had found a pocket handkerchief in the pocket of a dress which she had worn at Bangor, and she took the kerchief and shook it amongst the folks, and soon they all became sick with variola.

In the year 1862 **Diphtheria** first appeared on a high ridge of land in the adjoining town of South Sangerville. It went from house to house and was very fatal. In Corinna, the town south of us, the disease appeared about the same time and before it came to Dexter. Shortly it came to Dexter Village and here was quite fatal. The cause was not a contagion from one person to another, because it made its appearance where there had been no communication. In the town of Corinna it was quite mild, and a certain doctor said he had had sixty cases all terminating favorably. The people believed him skillful, so he was called to Dexter to see our patients, but with them his treatment went for nothing.

One case which led me to believe **Consumption** to be contagious was this:

A man who had lung disease for ten years had lost all his relation by this disease. His wife was a very healthy, thick, short-necked woman, never sick, and in whose family there was not a case of consumption known. They went to Massachusetts to live and rented small rooms; there his cough became worse. She slept in the same room and took care of him. Soon he died and shortly after his death she had a cough and spitting up of blood and died of consumption.

When we had **Small-Pox** here, to show the people how thoroughly vaccination will protect, I vaccinated a small son of mine who had not been vaccinated before, and after he had got all through

I carried him to a house where there were five persons with small-pox. He ate and drank cider in the room where they were, and where they had been during the whole sickness. After a few days I carried him there again and stayed an hour or more while I attended the patients. My son came out invincible, as of course I knew he would. People thought me very risky in taking the boy amongst the small-pox, but I knew what vaccination would do.

East Machias—E. Tuell, M. D.

Our leading diseases are pneumonia, ileo-colitis, cholera infantum, sporadic cases of typhoid fever, an occasional case of diphtheria, and the various exanthemata peculiar to childhood. Epidemics of scarlet fever have been few, only one in twenty years. Diphtheria once in the same time. But several times during that period, there has been an isolated case or two. Typhoid fever has at a few times been widespread enough, in certain parts of the town, to be styled a local epidemic. In the past two years there has not been a single case of typhoid fever. Small-pox has visited us three times.

In August, 1883, I was called to see a young man twenty-one years of age whom I found suffering with headache, backache, sore throat, fetid breath, temperature 103 and a bright scarlet eruption extending over nearly the whole body. Upon inquiry, the mother informed me that there had not been a case of **Scarlet Fever** in town for ten years. Also that the patient had not been away from home for several weeks, and had in no way been exposed. But, upon further inquiry, I learned that a sister of the patient had been at work during the previous winter in a town some twelve miles distant; and that in the month of February she had scarlet fever. In April she packed some clothes in a trunk and sent it home. Two weeks before the patient was taken sick the sister took a garment from the trunk and ripped it apart for the purpose of repairing it.

Phthisis quite prevalent. Hereditary tendency as a predisposing cause; climate, dampness, poor ventilation, exciting causes.

In our **School-Houses** we have imperfect ventilation and unsuitable heating apparatus; consequently, headache is frequent.

Eaton—P. W. Cody, M. D.

The prevailing diseases are pneumonia, follicular sore throat, croup, rheumatic fever, erysipelas, diarrhœa, neuralgia and pulmonary diseases. Diphtheria chiefly in winter months. Has appeared to be contagious. Termination is usually in recovery. Typhoid fever more common in summer; of a malignant type. Majority of cases are from sixteen to twenty years of age. Croup has occurred in my practice principally in winter season with usually quite favorable termination. This town was never visited by small-pox.

A child was taken with **Scarlet Fever** which ended in death. A short time after, its clothing was sent to a sister who used it for another child, the result being that scarlet fever broke out in her family.

Diphtheria is quite prevalent, caused by unsanitary conditions. Diphtheria was in a family. A child aged nine years came from a distance and slept with a child that had diphtheria. Death was the result of this carelessness.

In another house the water was impure from the nearness of the privy and the odor from decaying refuse was blown into the living room. Diphtheria broke out and carried off six children. Diphtheria is sometimes spread in schools.

At the burial of a young man who died from a malignant type of this disease, while lowering the coffin into the grave the lid came off, and the one who put it on again and also another person who stood near at the time were taken with this disease shortly after and both died. Several other persons who were at the burial took the disease soon after; of these, some recovered and some died.

Cases of **Phthisis** are quite frequent. The majority are hereditary, but some are caused by neglect of the laws of health.

The faults in our **School-Houses** are insufficient space and want of ventilation. Fainting sometimes occurs from improper ventilation. Much headache.

Exeter—F. N. WHEELER, M. D.

The prevailing diseases are typhoid fever, pneumonia, rheumatism, scarlet fever, diphtheria, diarrhœa, dysentery and tuberculosis. We have had no extensive epidemic of scarlet fever since the winter of 1875–76. Epidemics of diphtheria have been confined to neighborhoods, and due in every case to unhealthy surroundings (improper drainage). The last extensive epidemic was in 1879. Typhoid fever does not prevail in this town extensively as an epidemic. We have a few cases every fall, from two to ten. We have an epidemic of influenza about every winter, usually with complication of acute bronchitis. In one instance twenty persons within one school district, mostly members of the school, were taken within thirty-six hours, and all very sick for about three days, and most of them confined in bed for about one week. The last case of small-pox was twenty or more years ago, only one case. Previous to that perhaps two or three cases in the history of the town. The one case within my memory was a young man attending Bucksport Seminary. The pupils were out on an excursion in the woods; they came to a log camp unoccupied, which they entered and explored. It was soon ascertained that the camp had been used as a pest-house. The school was closed; this young man came to his home, in Exeter, had small-pox severely, but recovered. I do not know whether other pupils had the disease or not.

Fourteen years ago I was called to a child with **Scarlet Fever** in a secluded neighborhood. The family at first denied any possible way of contagion, but finally remembered that a peddler, stopping there to dinner, took the little one in his arms, and it was afterward ascertained that he had children at home sick with the fever. The neighbors, not realizing the danger, passed in and out rendering assistance, and in every case carried it to their children at home.

In our local epidemics of **Diphtheria** unhealthy surroundings and contagion have served to spread the disease. One family occupied a house where the slops were allowed to run into the cellar, and the family were not kept clean, either their person or clothing. The entire family took diphtheria and it spread through the neighborhood.

In another case the barn had been moved, the dressing allowed to remain to be washed off by the rains, with a well of water within ten feet of said spot. Diphtheria appeared, affecting all the children in the family as well as neighboring families.

Again, in a family of five children, one member took diphtheria away from home, came home and was sick. In due time the mother and remaining four children were taken sick.

A year ago or more, a physician in a neighboring town was treating a case of diphtheria, when he was himself taken with the same disease. Also a physician in Camden suffered like results.

There are many cases of **Typhoid Fever**, which we may generally credit to sink spouts, neglected privy vaults, but occasionally to neglected wells.

Cases of **Phthisis** quite frequent. In one family the parents both died of phthisis as did also their six children after reaching mature life. One, a son, remains, aged about fifty, in fair health, has never shown signs of phthisis, but has always paid strict attention to hygienic rules and principles. Several cases have come under my observation where the wife has died of phthisis, husband of healthy parentage and always strong and well, but in a few years after the wife's death has taken phthisis and died. One case in two years, another case in six years.

The **School-Houses** are heated by stoves with the funnel extending the whole length of the school-room, over the pupils' heads. Cold floors another trouble. Much headache.

Fairfield—M. S. Goodrich, M. D.

Lung fever, typhoid fever and diphtheria are somewhat frequently met with. We have had no epidemic of scarlet fever, diphtheria or typhoid fever in the last five years. We have had small-pox twice. In both cases clothing was infected while travelling. Cost of each case, $500.

I think unsanitary conditions play a very material part in the causation of **Scarlet Fever**, as most of my cases have occurred near low or swampy land.

Diphtheria has been somewhat prevalent, caused usually by bad sanitary conditions combined with changes in the atmosphere. The danger of contagion is shown in the case of oldest child of thirteen died; two other children and the nurse contracted the disease by coming near the sick child.

I have known **Typhoid Fever** recurring in successive seasons, caused by location near mouth of swamp drain.

Not many cases of **Phthisis**. Most frequently caused by imperfect ventilation and dampness, and I should think the bad ventilation of school-houses might help.

Our **School-Houses** lack ventilation and are situated on low ground. A great deal of complaint was made last winter of the ventilation, the only means of ventilating was by way of the windows. Two to five per cent of children sick. Much headache.

Fairfield—D. C. Perkins, M. D.

The diseases incident to childhood, pneumonia, diphtheria, rheumatism and renal troubles are the more common ones. There has been no epidemic of scarlet fever during the past ten years. In 1876–77–78 diphtheria of a malignant type prevailed, many cases (about forty in the village) proving fatal. There has been very little typhoid fever in town since I became a resident (1876). Small-pox once in the past ten years. It was brought by a young man returning from Puget Sound. It cost the town six or eight hundred dollars.

I knew of one case where a child was taken to a house where **Scarlet Fever** had occurred six months previously. The house had not been disinfected. In fourteen days the child was stricken with this disease and survived but a day or two.

In one instance four children out of a family of five died of **Diphtheria**. The disease was of the croupous form in these cases, and eight or nine of those in attendance as nurses or watchers contracted the disease to the extent of having diphtheritic patches in their throats. Some months later an uncle of the children, twenty-nine years of age, died of malignant diphtheria. It was believed he contracted the disease from furniture (a lounge) occupied by the children during their sickness. These cases were seen by some half dozen physicians. Children in this vicinity are usually kept from school by their parents, after having had diphtheria, until their clothing has been disinfected by airing, smoking, or otherwise. Have never seen it spread through schools.

In one instance three cases of **Typhoid Fever** occurred at one time in one family where the well which supplied the house with water was adjacent to a barn-yard. Have seen a number of severe cases, the subjects being factory operatives.

Cases of **Phthisis** do not occur very frequently. The causes here are: 1st. Heredity. 2nd. Poor food and want of proper ventilation. 3rd. Want of care on the part of subjects predisposed to the disease and neglect of parents or friends. Want of ventilation is a greater causation than dampness in this region, although both undoubtedly contribute to develop the malady. I have scarcely known a case that was not hastened by unsanitary conditions, generally poor ventilation.

The faults of our **School-Houses**, from a sanitary point of view, are air-tight stoves and no proper means of ventilation. While acting as School Supervisor or S. S. Com. I have often noted the prevalence in winter of coughs and colds with some cases of pneumonia among both teachers and scholars. Also while a teacher, I observed the same conditions. Headache is very frequent. I have repeatedly known teachers compelled to close their schools for days or weeks on account of sickness contracted in the school-room.

Farmington—J. A. RICHARDS, M. D.

Cerebro-spinal fever has been epidemic and endemic. Two years ago it attacked a family of six; all had it and three died, owing to moisture and filth. Had an invasion of small-pox in 1860 and another in 1870. In 1860 it was brought here by a resident who caught it in a stage coach. In 1870 it was brought through from Canada by a Frenchman.

I have known a person who had been where there was **Scarlet Fever** travel many miles and carry the contagion in his clothes so as to give it to children. Nearly every case could be traced to contagion.

Diphtheria has not lately been prevalent here. It spreads by contagion.

In a family of eight, every one had **Typhoid Fever**. An old lady of 93, a father and mother and five children. The old lady died, all the others recovered. The house was in a wet place. The well near the house on a lower grade and near the sink spout. Privy soakage and filth of every kind could find its way into the well and the effluvias went into the house.

In our **Schools** the greater faults are unsuitable conveniences for warming and ventilating. Headache is common.

Franklin—H. H. HOMER, M. D.

A portion of this town is a neck of land formed by adjacent ponds; it contains a large amount of swamp land, has been frequently visited by severe epidemics. **Diphtheria** has appeared here in its most malignant form. During the autumn and winter following a dry summer it has made its appearance usually, or at seasons where from any cause the water in the ponds has become low. I have reason to believe it an infectious as well as a contagious disease, especially among children. The prevailing diseases are affections of the air passages. Typhoid dysentery appeared here last August. The vats of a small tannery had been overhauled the first time in some years. No cases appeared except contiguous to these vats. **Small-Pox** appeared in 1873 and was confined to one family of two persons. It prevailed in Ellsworth at the time.

Consumption is quite prevalent, not by one but usually by a combination of causes.

Freeport—D. D. SPEAR, M. D.

In the fall of 1874 there occurred in this community a sporadic case of **Scarlatina**, the origin of which I have been unable to trace, though the subject of the attack had been from home. I could not learn that he had been in any way exposed to any infectious influence. His attack was severe, but regular acute nephritis following, from which he made perfect recovery. He was living at the time with a relative about one-half mile from his father's. After recovering from the attack, three months from the beginning having intervened, a new suit of clothes was brought him from home; not a single article of this apparel had he worn before; having had a thorough washing he was dressed in it and returned home. The first night he slept with a younger brother, who four days after was seized with scarlet fever, and subsequently four remaining children were attacked in periods varying from four to eight days from his first return home. This ended the visitation in this part of the town, but at the same time another case appeared in another family about two miles from this case. There had been no communication between these families, they being strangers. It occurred in the person of a child of five years. He died at the fourth day. I afterward learned that an older brother had returned home, having been living in a family, sixty miles away, in which there had been three cases of scarlet fever, though he had not had the disease. This occurred in January of the following year. The town was free from the disease until October, when there suddenly occurred in our midst, and within ten days of each other, thirty-five cases. It occurred to me that it would not be otherwise than interesting to trace its origin and follow its track, which at first seemed very mysterious, but soon shone out in light marvelously clear, though it required a good deal of enquiry and work to bring it into focus. A girl aged fourteen years, returning home from a factory, had a severe sore throat; no eruption. Each member of the family had the same affection in the same manner. No physician was called and the nature of the affection was unknown. A little girl of eight years, belonging to a district school, called at the house of the sick ones and remained an hour, returned to the school and continued to go for the next three days, when suddenly she sickened with what proved to be scarlet fever, with eruption and sore throat. Some six more fell sick from the same school on the following day, and within ten days fifteen in the neighborhood lay ill. It next jumped the space of four miles and appeared in another family in which were four children, all of whom became sick. These were infected by the same girl who returned home with the sore throat. The next appearance was in our village, which was about a mile from the other cases. It was in the person of a woman who spent an evening in company with the sister of the first one attacked, and who had also a simple sore throat. This patient had a diphtheritic-looking throat, a membrane, tough and of yellowish-white appearance, coming off on the eighth day. The eruption was characteristic but irregular. Death occurred on the eleventh day. From this last case eleven became infected, some having it in a mild form and one having it in a malignant form and dying on the third day.

Friendship—C. A. Parsons, M. D.

Pulmonary diseases are frequent. There have been but very few cases of scarlet fever in the last six years and not more than one or two of diphtheria, and no well-marked cases of typhoid. Measles were epidemic in the spring of 1884 in the southern part of the town and on the islands, and again in the winter of 1884-85 in the northern part of the town. The cases were complicated with bronchitis or pneumonia. Very few mild, uncomplicated cases. The winter epidemic was the most severe ever known in Friendship and Cushing. Do not know as there has ever been any cases of small-pox in town.

Diphtheria has not for many years been prevalent. I am told that there was much of it here several years ago and it was very fatal. It has seemed to me to be caused by a peculiar epidemic condition of the atmosphere acting upon persons subject to bad sanitary conditions. In 1863 or 4 I saw a great many cases of diphtheria in Somerset County. The first families attacked resided upon the tops of high hills where the general sanitary conditions must have been good. In some of the houses ventilation and other sanitary conditions were bad. It was more fatal in poorly-ventilated houses and in families that were filthy and careless of their surroundings. I do not think diphtheria is contagious in the same sense that small-pox or scarlet fever is. I should have little fear of attendants taking it if the patients were kept in well-ventilated, clean rooms, and proper sanitary conditions observed.

Have had no experience for several years with **Typhoid Fever.** Years ago, when residing in Somerset County, have known fever to prevail in same families in successive years. Have supposed the cause to be poorly-ventilated rooms, unclean cellars, uncleanly sink spouts, bad drainage, unclean and poorly-ventilated privies and bad water or proximity to swampy lands or nearly-dried-up ponds.

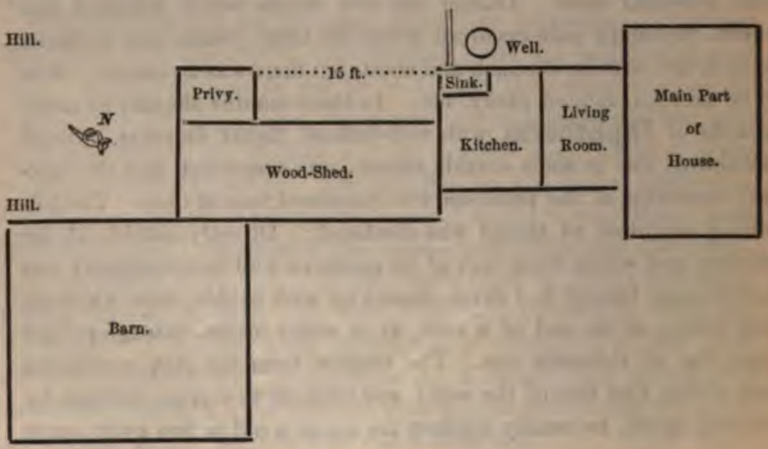
Cases of **Pulmonary Phthisis** are frequent. The habit of sleeping in small rooms undoubtedly predisposes to consumption, but in this vicinity the prevalence of fogs and southerly and easterly winds and the great dampness of the atmosphere are the great exciting causes of the disease. I have known cases in children which I supposed to have been caused by poor diet, insufficient clothing and exposure.

Our **School-Houses** are of small size, have low walls, cold floors, super-heated air overhead, no ventilation, low windows and bad light and stoves. There is much complaint of headache. Many scholars are obliged to leave school on account of it.

Fryeburg—D. L. LAMSON, M. D.

We have scarlet fever and diphtheria occasionally; typhoid fever very rarely. We have had small-pox five or six times in 100 years. The last two times the disease was brought by travellers from Canada.

Mrs. S., aged about thirty-five years, came from a neighboring town, after her marriage, a dozen years ago, to reside in the house which probably for fifty years or more had been the abode of her husband's parents, in Fryeburg. In 1884, before the birth of her third child, she became cachectic and dropsical, with considerable loss of weight and muscular tone. During the few weeks which followed this event, rheumatic pain occurred about the large joints, and frequent pain in the bowels, stomach and chest, but there was no cough. Was very nervous, fainted easily, etc. In three months she had as many attacks of **Diphtheria** with well-defined throat deposits. Blood poisoning, due to some outside source, was suspected, and the sanitary condition of the premises was examined into at once. The following condition of things was disclosed: Directly outside of the kitchen and within three feet of its northern wall (see diagram) was a well some twenty feet deep, stoned up with cobble, from which an iron pump, at the end of a sink, drew water inside, through a lead pipe, for all domestic use. The outflow from the sink mentioned was within four feet of the well; and while there was an attempt, by wooden spout, to usually conduct the water a rod or two away, quite frequently it would become obstructed and overflow upon the earth around the well. At the extreme end of the shed, perhaps fifteen feet distant from the well, and approximating the hill slope, was the privy. The wash from the privy by rains was always by a favoring grade from the hill toward the well. The same may be said of the barn-yard, on the southern side of the premises. Running water was supplied to the barn through aqueduct of lead, from the hill, except in season of drought, when it failed. The occupants were at once informed that probably the drinking water was the source of the disease. Work was begun to remove the earth about the well to the depth of six or eight feet, and at this distance below the surface it was so saturated and polluted with the sewage, the workmen could scarcely continue by reason of the stench. The water from the kitchen sink had dropped upon and reached through the soil, which was quite sandy and porous, for possibly half a century, into the well, so its waters had become completely polluted. The wonder is that other and older members of this household had not suffered at this fountain or tasted or smelled its vileness. It can only be explained that the ancestors had far greater powers of endurance than the generation which followed. It may be said, however, the paternal ancestor died twelve or fifteen years since from some chronic kidney disease. The use of this water was strictly forbidden and water for domestic use taken from the spring. The patient after awhile, by the aid of alteratives and tonics, began to improve, took on some bloom of cheek and physical vigor, and the pains ceased, but recovery was very slow, and at this date (Dec. 31, 1885), is very far from enjoying her former degree of health.



Gardiner—W. P. Giddings, M. D.

During the past six years, the entire time of my residence in Gardiner, we have had, with two exceptions, no one disease prevailing over those generally existing at all times in our New England towns similarly located; occasionally sporadic cases of the zymotic diseases. During the winter and spring of 1881–82 we had a very severe epidemic of **Diphtheria** in which **Scarlet Fever** freely mingled, so much so as to constitute them both epidemic. A most thorough investigation failed to reveal the foci of infection and it was only plainly proved by an extensive conflagration which providentially visited our city in June, 1882, destroying some two hundred and twenty buildings, principally in the north-eastern section, beginning at the Cobbossee Stream and extending to near the Farmingdale line. Most of the buildings covering this territory were tenement houses, long and poorly built, occupied, as naturally they would be, by the poorer and ignorant classes, who, without thought, care or knowledge, had permitted the various forms of filth to accumulate, fermenting and festering so long as to become a stench in the nostrils of the Almighty, one would almost think, leading Him to undertake for man what man would not undertake for himself and hapless children, and sent fire and purified the place, stamping out at once the united plagues, since which time our little city has been not only free from these scourges but *other* zymotic diseases up to the present time. From the abrupt stay of these diseases we must naturally conclude that somewhere within the district over which the fire spread there existed the germs of diphtheria and scarlet fever and were first propagated by the diffusion of the contagious principle through the air, then supplemented by the contact of the healthy with the sick, who in turn became victims.

Small-Pox I am creditably informed has invaded our town some ten times during the past twenty-seven years. The last time in 1880. It has been brought in the rags used in our paper mills more frequently than any other way, though some three or four times by direct communication. The last, in 1880, being introduced this way: A negro sailor from Philadelphia, coming on board a vessel to this port for ice, feeling ill, left the schooner and at night applied at the Police Station for lodging; the officer who received and placed him in a cell contracted varioloid, he in turn communicating it to his wife and they to their two children, who, both being unvaccinated, died of small-pox. From these cases five others resulted, making a total of nine. I am unable to state the direct cost to the city, but indirectly it was very great. as. through fear. people shunned our place, and trade and business were for a term virtually suspended.

In answering the questions pertaining to the causation of **Diphtheria,** so many difficulties surround them, that at best we can only draw conclusions from doubtful premises, and however strong our convictions personally may be, our opponent may raise a reasonable doubt. I believe, however, it is a contagious disease, bred in filth and fostered and fed by it. That it is infectious I am equally positive. To illustrate its contagious nature I will briefly relate a case coming under my personal observation. A family living in Cambridge, Mass., having the disease, were strictly isolated and the great fear of diphtheria among those surrounding them as neighbors, as well as those sought as nurses, made it necessary for a sister of the gentleman whose family was sick, to go from Maine to aid in caring for the unfortunate family. Two, who fell victims to it, died, and one recovered. Three weeks from the time of the recovery of the last patient, and after the most scrupulous care had been exercised in disinfecting the house and surviving persons, the sister returned to Maine, she having one daughter thirteen years of age, strong and healthy, whom she had left at home. Diphtheria had not been known in that section of the State for a long time, but five days from the return of the mother the daughter fell ill and died of the disease, after a brief sickness; no other cases succeeded it. Is it not fair and logical to say the mother brought in her clothing from Massachusetts the germs of the disease which caused diphtheria in the child?

As a rule our **School-Houses** are in good condition and fairly well ventilated, though in two, at least, a change is required for admitting fresh air. I have not observed any unusual amount of headache among our scholars. I do not think we have many cases of phthisis in our city or this section. I am not disposed to look upon the disease as in any degree contagious, though a few cases have come under my observation where doubt was induced; yet the question still remains whether the same amount of care, sympathy, loss of rest, irregular eating and vitiated atmosphere in any other disease might not induce the same form of phthisis which followed prolonged nursing of consumptives. I should, however, strenuously oppose the rooming together of a phthisical and a healthy person.

Gardiner—A. F. Plimpton, M. D.

The more frequently-appearing diseases are typhoid fever, diphtheria, scarlet fever, measles. For the last twenty-seven years I should say that we have had not more than ten or twelve epidemics of scarlet fever in this vicinity, and those not very extensive, but almost every year we have a few sporadic cases. The first cases of **Diphtheria** that I ever heard of in this vicinity was, I think, in 1862, when there were a great many cases, a large number of them proving fatal. The disease was prevalent also in 1863. Since then we have had no epidemic of the disease until 1881, when we had something of an epidemic, but the cases were not so fatal as those of 1862 and 1863. We have also had a few sporadic cases almost every year, which were seldom fatal. We have typhoid fever to some extent every fall and winter, but it can hardly be said to have been epidemic. Measles and chicken-pox at times have been quite prevalent, but seldom fatal. Cholera morbus, cholera infantum and diarrhœa are usually more or less prevalent nearly every summer and fall. In the last twenty-seven years that I have been practising medicine here I think we have had **Small-Pox** and varioloid in this town about ten times, the cases numbering from one to twenty-five each time. The origin of the infection has almost always been exposure to some persons affected with the disease or from handling old rags in the paper mills. The cost to the town each time has been from five to ten hundred dollars, the people afflicted usually paying their own expenses and not moved to a pest-house, but treated in their own home or where they were first attacked with the disease.

I think of one case in particular where the clothes of a child that had died of **Scarlet Fever** were sent about six weeks after he died to a friend who had a little one, and it was dressed in the clothes and in a few days was attacked with scarlet fever, although there were no other cases in the vicinity, nor had this second child been from home.

I was called to a case a few years ago that to me was quite interesting. From a neighboring town a physician came to me saying that he had just been called to see a child and wished me to accompany him. He said that a few days ago he had a patient in the same family that had died with some disease in a few hours after being attacked, but was not sure what the disease was, although he suspected it was scarlet fever, but was not certain, as there were no cases of the disease in the vicinity. I went immediately with him and saw the patient. It seems that the child was out in the field with his father about 10 A. M., when he was taken with vomiting, chills and slight sore throat. When we arrived he was still vomiting, pulse 170 and almost imperceptible, with great prostration. The child continued to sink until about 11 P. M., when he died. Neither of the children had any rash. The sanitary condition of the place was apparently good, nor had the children been from home. In two or three days another of the children was attacked with scarlet fever, which ran its usual course, and recovered.

I have seen repeated instances where persons exposed to **Diphtheria** were attacked with the disease, who, I think, would have escaped if they had kept away from the source of the contagion. I have also noticed the disease to be more prevalent where the sanitary conditions were bad.

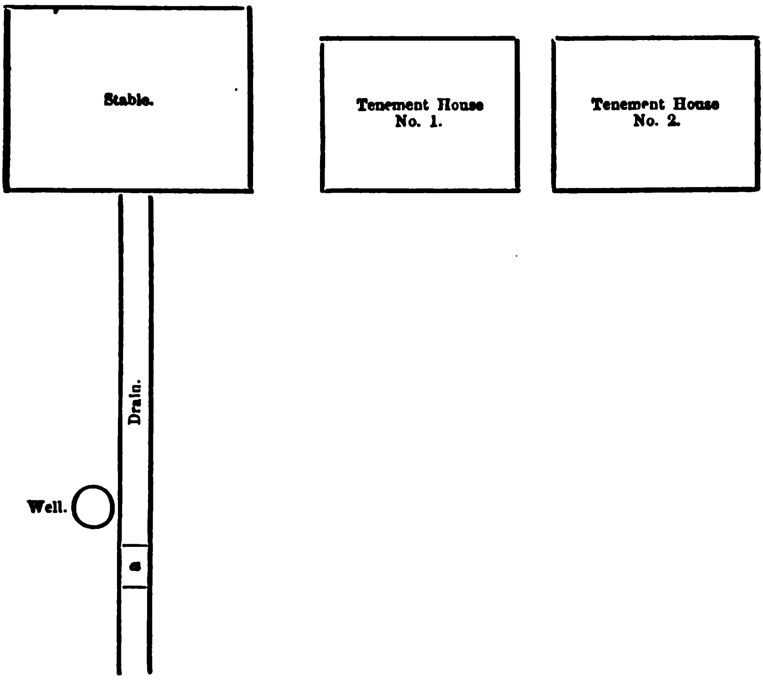
Phthisis is quite prevalent, as a result of hereditary tendencies, dampness, bad ventilation, sudden changes of temperature and infection. I have seen several cases where a person sleeping with and taking care of a patient with consumption has taken the disease and died with it.

Gardiner—P. R. CLASON, M. D.

Typhoid Fever is quite prevalent every fall. These cases can be traced more easily to their origin (which is generally a well located near a privy, sink spout or drain, or emanations from decaying animal or vegetable substance) than can the first cases of diphtheria or scarlet fever. Measles and whooping-cough have both occurred here epidemically within the space of four years.

I had one case of **Scarlet Fever** during winter of 1884–85, that occurred in a good family with healthy surroundings. The patient was a little boy three years old. No case in town as I could ascertain by diligent inquiry. The little patient had been *nowhere* to take it. By careful inquiry I learned from the mother that he had some clothes sent him that belonged to a little boy that had had "chicken-pox." The grandmother of the little boy came on from the place from whence the clothes were sent and I learned from her that the little boy at home, after he was apparently well, "peeled some and had a rough skin from which little scales would drop and rub off." We were convinced that the boy had a mild form of scarlet fever and not chicken-pox, and that my patient took the disease from those clothes. There is no doubt but that my patient had scarlet fever, for he had not only a high fever, rash and severe throat trouble, but also the usual sequelæ.

I had at one time five patients sick with **Typhoid Fever** in two adjoining tenement houses and there were two or three others at the same time attended by other physicians. The location of well and drain from privy and stable was as follows.



This well furnished all the water for both houses. Drain obstructed completely at the point marked (*a*), as was ascertained by digging it out at time when patients were sick. As the soil was firm and solid the well must have received drainage from the stable, privy, etc. My first patient came from Pittston, sick, into tenement No. 2.

Just two weeks and three days afterwards the next one was taken in tenement No. 1.

Our **School-Houses** are in good condition and will compare well with others in the State.

Gardiner—A. Sawyer, M. D.

In spring we have common colds, acute bronchitis and pneumonia; in summer, rose colds, hay fever very common, diarrhœas and some dysentery; in autumn, hay fever, typhoid fever; in winter, mostly bronchitis, pneumonia and lung affections. Consumption is very common, also asthma and rheumatism. **Small-Pox** has appeared once since 1880. This epidemic, which lasted nearly two months, cost the city not less than $1000.

The most notable case of the long retention of vitality of the **Scarlet Fever** contagion which I can now recall is the following:

On the 5th of Dec., 1881, I was called to see Mr. R.'s child, sick with scarlatina. The case was of the malignant type and proved fatal. The mother was taken down with the same disease during the child's sickness; the father escaped at the time. After recovery many articles in the rooms were destroyed, and all the furniture and bedding well fumigated as directed. A sofa, a new one, on which the child lay some of the time was well disinfected, as thought, and placed aside. The next May I was called to see Mr. R., and found him very sick with scarlet fever. On inquiry I found that a few evenings previously he came home from work from an ice-house and, feeling chilly, he got the sofa and took a sweat on it. He "broke up" the cold but in due time came down with scarlatina. As this was a sporadic case and no other cause of infection, I conclude he took the disease from germs retained in the sofa. In the above-cited case the contagion was retained at least five months.

We had **Diphtheria** in a severe epidemic form in 1881. I generally considered the cause originated from defective sewerage (which is very bad here in Gardiner), filth and lack of proper attention to drains about dwellings.

Mr. J.'s two boys, aged eight and ten years, had diphtheria at the same time, in 1881. Everything about the premises, from cellar to garret, appeared in perfect order. The causation of the disease could not be traced to any source till after recovery from the disease, when, in renovating the house, a leak was found in the pipe leading from the privy to the sewer, and by this leak the gas was continually escaping into the sleeping apartments of the boys. I always thought this the cause of the diphtheria in the family. During the epidemic here in Gardiner in 1881, the schools were very much broken up by the disease attacking many of the pupils.

Two years ago last fall I attended six persons, adults, that were sick about the same time with **Typhoid Fever.** All the cases were typical and ran a course from twenty-eight to forty-two days. These persons were members of four different families that resided in the same tenement block, built for the accommodation of four families. This block was on level ground; there was no drain from the cellar, and the waste from the sink drains soaked into the ground under the house. The water used was from cisterns built outside and not in the cellar. The privies were located in the woodsheds, just in the rear of the house. As everything about the dwelling was in a filthy condition, I have no doubt the sickness was caused by unsanitary condition. This present fall I attended one case of fever in the same house.

Again, last September, typhoid fever broke out in the Independent Ice Company's boarding-house. There were seven cases, four of which were adults; of those I attended five, and the other two, when coming down, went home and had a full run of the fever. Now this is an old boarding-house; the surroundings are very bad indeed. The drains from the house are in a very imperfect condition. The privy, hen house, cow stable and pig pen are all located in the back yard, and the whole surroundings point to the unsanitary conditions as the cause of the typhoid fever.

There are many cases of **Phthisis.** Most of the cases seem to have a hereditary origin.

Mr. H., whose family I have known and attended for the past seven years, is of a consumptive family. He has had a cough for many years and is now very feeble and far advanced in pulmonary tuberculosis. This man is the father of four children, three of whom are now dead, having died with quick consumption between the ages of twenty and twenty-eight years. The one now living is a young lady of eighteen years, feeble in health, has a cough, with distinct evidence of disease at the apex of the left lung, and in all probability will fall a victim to consumption within two or three years. The mother of this family has a good history. There is no taint of consumption on her side. She nursed, attended and waited upon all of her children in their last sicknesses, and lived as one might say for six or seven years all the time in an atmosphere contaminated with consumption, yet she was a well, robust woman till one year ago last March, when soon after the death of her son, without taking any cold, she was taken with a cough and died in the following October with consumption of the lungs at about the age of sixty years. The history of this family seems to me to clearly illustrate, in the case of the children, the hereditary tendency of phthisis, and the mother's history seems to show the infectiousness of the disease.

Garland—F. A. C. Emerson, M. D.

According to my records, pneumonia, phthisis, enteritis of various kinds, simple fevers, typhoid fever, prevail in the order named respectively. Rather a large number of cases of typhoid aborting at the tenth to fifteenth day, or soon after the appearance of the eruption. There have been no epidemics. Small-pox not known in the last twenty years.

There has been no case of **Typhoid Fever** in town since my residence here; and there has been but one case of **Diphtheria** in two years; this was contracted out of town and prevented from spreading by great care and immediate burial without funeral.

I have had cases of **Typhoid Fever** arising from such sources of water-pollution as you mention. Case of Mrs. G. A. History of "Low Fevers" in family for several years in autumn. On examintion of premises I found the privy and sink spout both within thirty feet of well, which was sunk in shaly ledge, covered by about four feet of soil. On removing the planking from well, found the side of ledge toward the sink and privy moist and dripping. Water in well showed reaction for Chloride of Sodium. I advised Mr. A. to lay a brick curb in cement from the ledge above the surface, move his privy and conduct off his sink slops, which he did; this was last fall and we have yet to see the result.

Cases of **Phthisis** are common. Heredity with the neglect of initial symptoms seem to be the causes. In my humble opinion a very small part of the prime cause, and a very large part of the exciting and sustaining cause is due to ill ventilation and moisture. Bad ventilation of school-houses, in this town at least, is not so much a cause as the great irregularity of temperature. All but one of my cases of phthisis have been traceable to hereditary taint, and that one was Mrs. W., who was round her husband through a fatal attack of phthisis; persisting, contrary to advice, in sleeping with him most of the time. Two weeks after his decease, she, without any discoverable hereditary taint, developed symptoms of the same disease, dying in about four months.

Lighting from the front, black-boards between the windows, irregular heating, are the unsanitary arrangements found in our **School-Houses.** The most of the cases of disease which I can ascribe to faults in the school-houses are weakness of the eyes, mild conjunctivities and frontal headache in summer and colds of various degrees in winter. Not more than 20 per cent on the sick roll. Headache not frequent. The patient would be isolated and school closed until it could be ascertained whether others had contracted the disease, if scarlet fever should break out.

Georgetown—J. A. STEADMAN, M. D.

A woman from this town nursed her grandchild last March in Bethel, came home, and **Scarlet Fever** made its appearance first in her family, then among the neighbors. No deaths.

A woman died of **Diphtheria** in Lynn, Mass., some time ago. Her son brought her clothes and bedding home, his wife washed them, took the disease and died in less than a week.

Cholera is quite prevalent. The causes seem to be lack of nutrition and exposure to sudden colds, etc., damp and insufficient ventilation of dwellings.

The **School-Houses** are small, not well ventilated, and the seats are old style and uncomfortable. Headache is a frequent complaint.

Gorham—A. W. LINCOLN, M. D.

The prevalent diseases with me have been pneumonia, asthma and rheumatism. Catarrhal fevers are usually protracted. Scarlet fever has not been very prevalent for the past ten years, and when it has occurred it has assumed rather a mild form. Diphtheria has not prevailed very extensively but has been very fatal in some families. Typhoid fever has been a rare occurrence; there have been but a very few cases the past decade. Some isolated cases of mumps have been regarded as brought about through endemic influence.

Small-pox has occurred but once in ten years. The last case was through infected clothing; the cost per case was about $200.00.

Two or three cases of **Scarlet Fever** have come to my notice where no other cause could be attributed except infected clothing. I have known rooms to retain the contagion for more than a year, and clothing for a long time. I have no knowledge of any particular case in which the disease was spread by public funerals, but am of the opinion that it is sometimes spread in that way.

Fifteen years ago I had two patients (sisters) who were taken at the same time and the cause was unquestionably the same. Their father, a tin peddler, was sorting over some rags when his two daughters came around and began picking out the bright pieces and in a short time were taken down with scarlet fever.

Diphtheria is not very prevalent. I believe that unhealthy conditions are a very fruitful cause of the disease. I have known eighteen children to fall victims to this most dreaded disease in one district. I knew of one case where the child took diphtheria at a funeral.

Many times, during a practice of twenty years, I have known **Typhoid Fever** to be caused by unhealthy conditions, such as water which has been polluted by privy, sink drain or cess-pool. I have known certain localities where typhoid fever seemed to prevail every season. It was largely due to decomposition of vegetable substances.

Phthisis is not very common. Heredity is undoubtedly the most potent cause. Much is due also from dampness and from the bad air of school-houses, I believe. I have known a wife, who had no hereditary taint, living with a consumptive husband, succeed to the disease.

Gray—E. A. McCollister, M. D.

For two years past, scarlet fever, diphtheria, typhoid fever, pneumonia and rheumatism have been the more frequently-occurring diseases. No epidemics for two years past. At four different times in forty years small-pox has appeared.

On July 3, 1884, two children came to E. F. L.'s at Gray from Cumberland Mills, a place where **Scarlet Fever** then prevailed. They remained about four days. On July 20th, I was called to see a daughter of Mr. L's, seven years old, with undoubted scarlet fever. The next day another child came down with it. None of the visiting children had the disease. These cases were isolated and antiseptic freely used. No other cases appeared and no other means of contagion suggested itself. There were no other cases that I could learn of nearer than ten miles, and there had been no communication from any district, contagious or otherwise.

At times there has been considerable of **Diphtheria.** My cases have come from contagion. On the 27th of April, 1885, Miss L., a domestic in a family in Portland, a family then sick of diphtheria, came to Gray, complaining immediately after her arrival of headache, backache, and with other symptoms of diphtheria which she certainly had. She was isolated and clothing washed, but my directions about the use of disinfectants were only partially carried out. She says there was a handkerchief or two she used while sick that were not washed, but carried in her trunk in about three weeks to her own home, three miles distant, where a malignant case of diphtheria appeared on June 7th, followed in a few days by four other cases, three very severe.

One home with three cases, where discharges were thrown on the ground near the house, which is above the well on a hill, had **Typhoid Fever** recur three successive seasons. In this case infection seems probable.

There is not more of **Phthisis** than in other towns in this county.

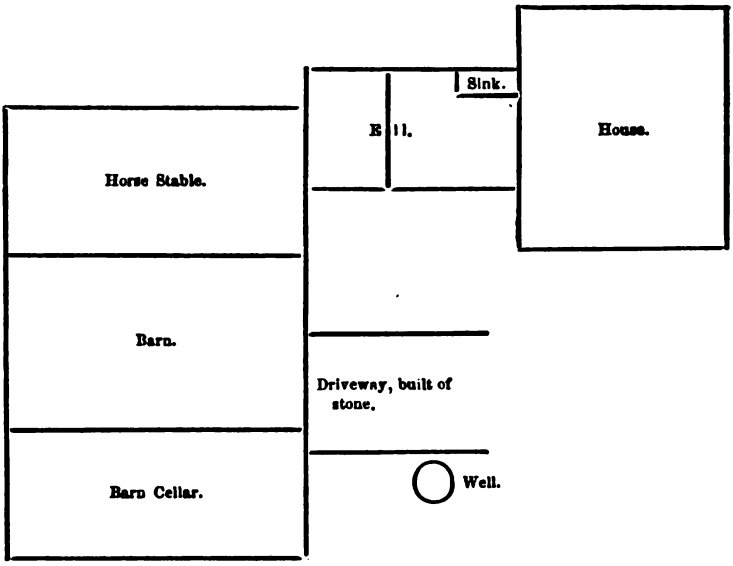
Greenville—H. Hunt, M. D.

Especially is this region favorable to lung diseases or nervous diseases. Numbers each year visit Moosehead Lake afflicted with these and almost invariably find relief. Asthmatics generally find an atmosphere that they can breathe. I have noticed that patients with seriously-diseased lungs have improved and lived longer than I thought possible. For the past two years there has not been a death from any lung disease. **Scarlet Fever** has not been seen here for years. **Diphtheria,** except in a mild, questionable form, has not been seen. There were four cases of **Typhoid Fever** in March, 1885, all traced to the poor sanitary arrangements of our houses. I had four cases of typhoid fever which were undoubtedly caused by polluted water. The privy and cess-pool were ten feet from the sink spout and six feet from the well.

Cases of **Pulmonary Phthisis** are rarely seen in this section.

Guilford—C. B. Bennett, m. d.

There have been eleven cases of **Diphtheria** in twenty-two years; only five proved fatal. Contagion is the usual cause. The night of June 5th, I was called to visit a child in Sangerville, sick with **Scarlatina**, who had a very sore throat, with the glands very much enlarged. At my sixth visit, on the sixth day, I found the other three children sick, all taken the night previous with **Diphtheria** in a bad form, especially the eldest boy which case proved fatal. The location of the buildings is on a side hill with the land sloping to the west and south, and high and dry. The following sketch will explain the arrangements.



All the space between the ell and the driveway was filled with dirt taken from the barn cellar, and the driveway was covered with the same. The barn cellar was a part of the cow yard last year. The well is four feet from the driveway and thirty-six feet from the sink spout. My opinion is that the water was poisoned by soakage from its surroundings, and especially from the washings of the dirt which was taken from the barn cellar. There was not, to my knowledge, a case of diphtheria in the county before these, and there have none followed these.

Hallowell—M. M. Leahy, M. D.

There has been no epidemic of either scarlet fever, diphtheria or typhoid fever here.

I knew of a case of **Scarlet Fever** in which the contagion was communicated by means of clothing. It was that of a child which had been carried by a nurse who had been attending a case of scarlet fever and had neglected to have her clothing disinfected. Have known of cases in which the contagion seemed to retain its vitality a long time in clothing and in rooms; also of its having been *spread by public funerals*. I believe the disease is generated by unsanitary conditions. About three-fourths of the cases I have attended seemed to be due to infection derived from other cases.

Diphtheria has not been prevalent here. I think the most frequent cause of the disease is contagion. Have known it to spread through schools, but in the cases I have in mind the school-houses were badly ventilated.

I have seen localities where **Typhoid Fever** has recurred in successive seasons. Have thought it was caused by the draining of a privy vault into a well, the water of which was used by the family.

Cases of **Pulmonary Phthisis** are very frequent in this part of the State. I think it is partly hereditary and partly caused by ill ventilation and dampness. In my opinion about one-fourth of the cases are caused by dampness and one-half by ill ventilation; the rest by heredity and various other causes. I believe that the bad ventilation of school-houses has something to do with causing the consumption of later years. Two cases were caused, I think, by the patients working in a close basement room, badly ventilated, and in spring, autumn and winter, very damp. There was a family of six children, five of whom died of phthisis. The father, his two sisters and the grandfather died of phthisis. The mother's brother (uncle to the children) died of the same disease.

The infectiousness of phthisis is shown in the following case: A young man ill with phthisis married a strong, healthy, young woman. Six months after marriage, phthisical symptoms developed in the wife. Her family history showed no case of phthisis, and she was perfectly well when married.

All our **School-Houses** are well ventilated and lighted. A very small per cent of the pupils are absent on account of sickness. If a case of scarlet fever or diphtheria were found in the school, thorough disinfection would be enforced.

Harmony—WM. M. LAUGHLIN, M. D.

Consumption, pneumonia, bilious and typhoid fevers constitute the prevailing diseases. A few years ago diphtheria prevailed alarmingly, and scarlet fever and typhoid fever occur occasionally. Small-pox has not been in the town for nearly twenty years.

Unsanitary conditions have usually been the cause of **Diphtheria.** It has been spread in the schools, but vigilance may prevent it.

Cases of **Typhoid Fever** as the result of bad hygienic conditions have presented themselves to me, and I have known of the successive recurrence of the disease in the same household explained by the continuance of the same conditions which were present in the previous cases.

Pulmonary Phthisis is very frequent here. The causes are hereditary tendency, taking colds by insufficient clothing, etc. A small proportion of the cases are caused by imperfect ventilation; more by dampness. I do not think the bad ventilation of school-rooms has much to do with causing it. Many school-houses have too much and too faulty ventilation. The fault lies more in inadequate and improper heating or warming.

The faults in the **School-Houses** are improper seats, improper heat, and too much ventilation and in the wrong places.

Harrington—GEORGE H. WALLING, M. D.

Among the prevailing diseases I would particularize consumption, rheumatism and typhoid fever. There has been no diphtheria for twelve years. A mild epidemic of scarlet fever last year. Have had no general epidemic of typhoid fever. I don't know of a case of small-pox.

Consumption is quite frequent, caused by exposure, cold, poor ventilation and predisposition.

Hermon—F. P. WHITTAKER, M. D.

Some of the more prominent of our diseases are phthisis, typhoid fever, pneumonia, rheumatism, liver diseases, cholera morbus and cholera infantum. In three years I have seen no cases of scarlet fever or diphtheria. I understand that small-pox has been here twice.

In two cases of **Typhoid Fever** there had been previous cases in the same place. In another, the sink water was allowed to remain on the surface with privy, barn-yard, well, all within forty feet of dwelling-house, and privy and well only twenty feet apart.

Cases of **Phthisis** are frequent, the causes of which are inherited tendency, climate, bad ventilation and pneumonia.

The gravest fault in our **School-Houses** is the bad ventilation. Headache is prevalent.

Hodgdon—J. S. White, M. D.

I believe small-pox occurred in this town some ten years ago.

Have not seen a case of **Scarlet Fever** since coming to this town five years ago.

Diphtheria has not been very prevalent, except in 1882. At that time we had an epidemic of the disease in the eastern part of the town. In my opinion the disease has been caused by decaying chip-yards, dirty cellars, bad drainage and living in old and crowded houses.

Have had a few cases of **Typhoid Fever** caused by pollution of water, dirty cellars and privy vaults. I had seven cases in one house which I attributed to decaying vegetable matter, a part of which was an old chip-yard of some forty years' accumulations before the house.

Holden—W. E. Merrill, M. D.

So far as I can learn, diseases rarely occur here as an epidemic. I am told there were a few cases of small-pox here about 1865. The cost to the town I am assured was but a small sum.

Diphtheria has not been a prevalent disease in this town.

Cases of **Consumption** are frequent. In regard to the infectiousness of phthisis, I attended a lady who died of this disease in March, 1884. The husband, apparently healthy, then or soon after went to live in his father's family. During the summer his sister was taken sick and died in January last of the same disease. He began to fail in health last fall and died of phthisis in May.

Imperfect ventilation and faulty heating apparatus are the two worst faults with our **School-Houses**. A large percentage of the pupils are kept home on account of sickness. The children belonging to the family would be kept at home and possibly the school might be closed for the time if scarlet fever or diphtheria appeared.

Hollis—J. A. Fellows, M. D.

I have had two or three epidemics of scarlet fever and also of diphtheria within six years. Not very much typhoid fever. Small-pox has appeared once.

In the several epidemics of **Diphtheria** which we have had, the cause seems to be infection. In the epidemic five or six years ago whole families of children had the disease and in some cases all died, but it did not spread to a great extent outside of a few families. Some cases seemed to be caused by impure water.

Cases of **Phthisis** are quite frequent and the principal causes are hereditary influence, dampness and impure air.

Howland—J. H. McGregor, M. D.

There has been no case of typhoid, scarlet fever or diphtheria within the town limits during the last five years. I learn that thirteen years ago there was an epidemic of **Typhoid** at Howland Point. Seven cases in a population of thirty persons. The initial case was that of a young man who returned home from Pennsylvania sick. I have seen one case of **Phthisis** during the five years that I have resided here (in the town limits), which was undoubtedly inherited.

The two **School-Houses** in the town are of the usual sort; heated by stoves and ventilated by letting down the windows at the top.

Industry—Wm. C. Hatch, M. D.

No disease has prevailed as an epidemic within the last five years. Small-pox invaded our town once, about twenty-one years ago.

About nine years ago the family of a rag collector contracted **Scarlet Fever** from sorting the rags purchased. This collector bought the rags in a neighborhood where scarlet fever had prevailed some months before. The people are quite careful in regard to public funerals after contagious diseases.

Diphtheria has not prevailed in the town of Industry to any extent for the past fifteen years.

There have been no cases of **Typhoid Fever** in town for the past eight years.

Wells and privies are often located too near each other, and I am convinced that from this cause the water of many wells is rendered unfit for use. Your circular on the construction and management of earth closets is a grand thing, and ought to be placed in the hands of every family in our land. Lectures on public hygiene would prove of great value. The people are surprisingly ignorant on this subject.

Should not think over twenty per cent of the deaths are from **Pulmonary Phthisis.** The more frequent causes of this disease are sudden colds. I believe that bad ventilation of school-houses, unsanitary conditions and the hereditary tendency of diseases have an important bearing on nearly all diseases, but to the exact extent I am unable to say.

I have visited many schools and given the subject considerable thought and study. I find country **School-Houses** defective in four very important respects, viz:

1st. They are not supplied with proper apparatus for heating.

2d. They have no arrangement for ventilation save, perhaps, a chance to lower the window sashes from the top. Through this opening the cold air must enter and the foul air escape. In such cases colds are common among the pupils.

3d. They are improperly lighted, but few having any means for regulating the supply of light.

4th. Seats are constructed on decidedly unphysiological principles. It would cost but little more for good seats and desks constructed on accurate physiological principles, while the good resulting to the pupils would be of inestimable value. Every school-house should have available an abundant supply of pure water. I cannot recall a single school-house where the school is not dependent for its supply upon the nearest farm-house. There are many other things connected with our schools which bear directly upon the public health. Of these we will speak further if you wish. The writer once attended a school where the room was warmed by an open fire in an old-fashioned fire place; colds and headaches were things almost wholly unknown among the pupils.

Jonesport—J. A. WALLING, M. D.

Phthisis and typhoid fever are the prevailing diseases. We are very free from scarlet fever; I have not had a case here, and have yet to find a person that has heard of one; diphtheria is also very rare. Typhoid fever has occurred as epidemics, besides the scattered cases. A majority of the cases seem to be due to impure water. In one epidemic, a number suffered on the same street, and they used water from the same well, and this is considerably lower than the out-houses. Within two years we have had two visitations of measles and whooping-cough. I know of no case of small-pox occurring here.

Consumption is quite prevalent here and I should say that the causation is about evenly divided between dampness and poor ventilation. Phthisis has been very prevalent on the islands about this place, due, in my estimation, to poor ventilation, especially in winter time, when the family is all confined in one room and every chance for ventilation closed. There are many families here in which phthisis attacks every one in the family, no matter under what different conditions they may be placed; this seems to me to be evidence in favor of the theory of hereditary influence.

Kennebunkport—LYMAN CHASE, M. D.

Rheumatism, pneumonia and phthisis are the prevailing diseases. The epidemics of scarlet fever have never been severe, deaths very rare. Diphtheria is never found in the village and vicinity; a few cases in extreme northern part of town. Typhoid fevers very rare. Both of these prevail in Biddeford and Saco, only nine miles east. Membraneous croup is almost never met with.

Public funerals of **Scarlet Fever** cases is a good way to spread the disease.

No **Diphtheria** for many (at least ten) years.

The majority of the cases of **Typhoid Fever** have been traced to the water contaminated by privy vaults, sink drains or barn-yards. Have never seen in this region a single case where the water was pure and the sanitary conditions good.

Cases of **Consumption** are very frequent. The causes are heredity, contagion, unfavorable trades and the breathing of impure air. In females, thin shoes, insufficient chest clothing, neglected colds and confinement to ill-ventilated rooms. Most of our winter homes in this region are hot-beds for generation and growth of tubercular disease. Stove heat, double windows, night air often below zero, increase the percentage of the disease by one-half. I could give several cases which seem to prove the infectiousness of phthisis. The following is one of them:

A mother died of phthisis contracted late in life, over fifty years. Her daughter, a robust girl of eighteen, on a farm, in a very healthy locality, took the entire care of her mother. Soon after the death of the latter, she showed all the symptoms of consumption, with evidences of tubercular deposit on left lung. She was for many months under treatment and apparently recovered, and has since married. The case was so marked that I look for a fresh breaking out of the disease.

The faults in our **School-Houses** are many. Headache is much complained of, especially where, as in most cases, the ceilings are low and a stove pipe passes over the heads of the pupils.

Lewiston—O. A. Horr, M. D.

Since our municipal incorporation, the records of our city government show that **Small-Pox** has made its appearance in nine out of the twenty-two years that have elapsed, namely:

1864	5	cases
1865	14	"
1866	4	"
1867	20	"
1872	2	"
1873	20	"
1875	2	"
1885	1	"

I do not know how many distinct outbreaks have occurred, but am quite sure that in some of these years there have been more than one; probably the disease has come anew as many as twelve or thirteen times during this period. It, furthermore, should be stated that these records take cognizance of only the cases which have been under the care of our city physicians and it is quite likely that some have been under the care of other physicians. The number that have been thus privately treated I am not able to state, but think it might be 20 per cent of the whole. Some of the outbreaks, I think, have cost the city from $1500 to $2500.

The epidemic of **Cholera** occurred in 1854. Lewiston was among the first places in the State to be smitten, but to the best of my recollections not the first. It made its appearance in the early part of August and did not disappear till some time late in September. I think there were about thirty-five or forty cases and possibly more than forty. Quite a per cent. of the cases were children, though it claimed its victims among youths, adults and those of advanced years. I think about forty per cent. of the cases were fatal. While cases occurred in various parts of the city, a large part were in badly-drained and unhygienic localities. The foreign population suffered in a much greater ratio than the American. The part of the city furnishing the greater proportion of the cases was that lying north of Main Street and east of Chapel Street, or that part not far distant from the Maine Central Upper Depot; a part of the city at that time very poorly drained, quite thickly populated, with abundance of decaying animal and vegetable matter, the people mainly depending upon wells for their supply of water. A few cases of the disease occurred in Auburn. Dr. Charles Millet of Lewiston, one of the prominent physicians of the State, died of the disease at this time.

Limington—S. M. BRADBURY, M. D.

We have a variety of diseases, pneumonia, bilious, rheumatic and occasionally typhoid and scarlet fevers, croup, etc. I think we do not have a clear case of scarlet fever oftener than once in four or five years, then as an epidemic. Four years ago I had two children very sick in one house, one of them had a violent hemorrhage of the bowels; at the same time I had three in one house two miles away, mild cases, all recovered. It is very seldom we have a genuine case of **Diphtheria,** but a good many cases of sore throats, some of which might be called diphtheria, the croup often. **Typhoid Fever** not often, but it was very severe forty years ago, when it prevailed as an epidemic in the fall of the year. I had twelve sick at one time. **Small-Pox** has appeared three times in forty years. The first case was in a man forty years of age, who, to show his courage, put on the hat and gloves of a man who had died of small-pox. He had never been vaccinated and would not be. In about two weeks he began to be sick, his wife gave him a good sweat, the death blow. I was called and found him very sick with the confluent small-pox and told them he would die and he did in three days.

The next case, some fifteen years ago: Mr. C. came home to his family of wife and two girls, seven and nine, with the varioloid pustules in the state of maturation. I saw them in a few hours and vaccinated the girls, and again the next day. The younger girl took the vaccination, the other did not. The younger girl had a common case of varioloid, the other, a hard case of small-pox, but got well. The wife had been vaccinated some years before, she took care of the girls and did not have the varioloid. The third time, Dr. —— who lived in another town and was taking care of a case of small-pox there, came to see a patient in our town and so when he left his patient he also left the small-pox with her, and four of the family had it, as they had not been vaccinated.

Sixty-eight years ago **Yellow Fever** prevailed in the western part of Parsonsfield and Ellingham, N. H., one season.

We have **Phthisis** occasionally, but it is not frequent.

In our **School-Houses** the ceilings are too low and we find hot, bad air, bad seats, low desks. I do not think our school-houses now, with their box stoves and dry, hot air, are so well ventilated as they were years ago when they had the large open fire-places. Headache is now very common and often scholars have to leave the school-room for some days on account of the faulty ventilation. We have some new school-houses which are very great improvements over the previous ones.

Lincoln—C. Fuller, M. D.

The prevailing diseases in this town are colds, sore throat, bronchitis, pneumonia, diphtheria, diarrhœa, dyspepsia, and of late years a good deal of bladder troubles, gravel, cystitis, stone, etc. A peculiar feature, the past spring, was an affection (endemic) of the walls of larger bowels, with fever, great pain and constipation, lasting about eight days. No epidemics of diphtheria since 1876, when twenty deaths occurred; but it still lingers about here, and we have one or two cases every year. Had one case in worst form last August, that of a boy about nine years old. Scarlet fever has not been prevalent for five years, although we have isolated cases of it every year. Typhoid fever about the same. We have had small-pox three times; in 1855, 1860 and 1879, as near as I can remember. It was brought here by people each time, and probably cost $200.

I think that about nine out of ten cases of **Scarlet Fever** are caused by unsanitary conditions at first. About one-half of the cases are due to infection derived from other cases.

There was an epidemic of **Diphtheria** in this town in 1860 and one in 1876; in the former, whole families were swept away; in the latter, about twenty died, and those mostly among the French and where they refused or neglected to separate the patients. In 1876 the disease was brought, first from Medway to Chester, then here. I attended the patients (two children) where the mother employed a girl from Medway who had recovered and been at work for four weeks. Change of weather is a frequent cause and in certain back settlements it seems to linger where it may be caused by a want of proper food, as I believe. The diphtheria was once brought here by a girl attending school, living two miles above. I remember one case where it was spread by a funeral and the result was four deaths; it occurred about eight years ago.

I have had cases of **Typhoid Fever** caused by drinking brackish water; two different times men at work haying for a man contracted the disease; do not remember that I ever had a case that I could not trace to drinking polluted water as the cause.

Probably three people on the average die every year of **Phthisis** in its different forms. I think the more frequent causes of this disease are heredity, cold, damp weather and sudden changes and impure air.

I had cases (three) of phthisis where first a daughter, then a son, died, and now another daughter is sick with consumption where it was inherited from the mother; indeed all cases I ever had could be traced back to heredity as the cause, except one, viz: Mr. A., a rugged young man just married, was sick with consumption about eighteen months and died; his wife, Mrs. A., was a healthy young woman with no sign or taint of the disease about her or in her family; but she was very faithful in nursing her husband who, while sick, persisted in keeping shut up (during last three months of his sickness, in spring of year) in a hot, stifling room; and I remember going into the room and not being able to remain in the nauseous, hot atmosphere, although they lived in a good house with plenty of room; very soon after her husband's death she was taken sick, first with pleurisy which developed into quick consumption and she died in about four months.

The most common faults in the **School-Houses** in this town are their being small, poorly ventilated and low posted; except in four out of ten districts. Have noticed one or two ill from over-heating rooms. About twenty out of five hundred pupils are absent on account of sickness. Headache does not occur very frequently.

If a case of scarlet fever or diphtheria were found in the school-room the school would be closed and the sick isolated. Our town school-house in District No. 3 is poorly constructed, windows nearly all on one side, with room for the smallest pupils in second story; no ventilation in any school except by the windows and doors.

Litchfield—ENOCH ADAMS, M. D.

In thirty-four years we have had no widespread and severe epidemic of scarlatina. A few families have been so afflicted, but as a rule, if it extended beyond the first family, it took on a lighter form. Since 1858 there has been only limited areas of this disease (in my field) and those mostly of a mild type. **Diphtheria** broke out in the center of this town; about a dozen cases with one death. In 1862–63 (winter and spring) there was a severe epidemic of it starting in the same place and carrying off about twenty-five persons. In 1864–65 a sharp epidemic affected a portion of Gardiner. Four from one family and one each from two others died. The disease was much more severe in the first family visited. Three times has typhoid fever visited neighborhoods, affecting twenty to thirty persons. None for two years and little for nine years past. **Small-Pox** and varioloid in my practice five times. Three of these were varioloid contracted away from home and no expense and no contagion spread except in one instance, before any physician was called and then only mild varioloid to a few individuals. The two attacks of small-pox cost about $250.

I have often been puzzled to see how slight an exposure from clothing worn was thought to be the cause of a spread of **Scarlet Fever,** while much greater and even direct exposure produced no effect. I have known of two cases where after two years, toys in one case, and clothing in another, were the only known source of the contagion of scarlet fever. Scarlet fever visited my father's family three times, taking one or two at a time, passing by a pair of twin sisters, and one of them afterward nursed in a family where it prevailed. Years after, when she had a family of small children and seemingly had no possible chance for contagion, she was taken down and died with the disease in two or three days and all of her children had it in about three days and one of three died. The other twin sister was with her when she died and attended the funeral, and the children were then sick too. Two years later, with no source of the disease possible but the use of some clothing from the others sister's home, which had been in her house for two years past, she was taken sick and died before the rash had time to appear. Her three children also became affected from her. Now both of these sisters lived in border homes, in healthy locations, and so isolated that we can be quite sure of the facts suggested.

One of Boston's health officers rode with me past a house one August evening, when a peculiar scent reached us and he remarked "There is **Typhoid Fever** in that smell." Within a week I was called to attend a set of the severest typhoid cases in that house and one after the other all came down with it.

In the cemetery in West Gardiner there lie side by side two mothers, one father, and twelve children, all having died with **Consumption.** I know of ten or a dozen cases of healthy wives or husbands who have followed in a year or two their companion who died of this disease.

The most common faults in the **School-Houses** are low ceilings, ill-ventilated and badly-heated rooms. The most frequent school-room diseases are catarrh, headache and sore eyes.

Litchfield Corner—I. W. GILBERT, M. D.

The more frequently-occurring diseases are bronchitis, pneumonia and isolated cases of contagious diseases.

I have known of **Scarlet Fever** in a family where there was no possible source of infection except by a letter received from a friend in whose family there were cases of the disease.

I had five cases of **Typhoid Fever** in one family, the only recognizable source of infection being the drinking water which was taken from a well in the cellar, the top of the well being less than ten feet from the sink drain. No other cases in the vicinity.

Consumption is not very prevalent.

Livermore Falls—A. R. MILLETT, M. D.

The prevailing diseases are typhoid fever and pneumonia. **Scarlet Fever** for the most part has been of a mild form. In one instance the fever made its appearance in a house where there were three children all of whom had it quite severely; all recovered. In a house one-third of a mile away in which there were two families living, it made its appearance. In one family there were four children all of whom had the fever and all died. In the other family of three children none took it. These people lived away from the main road more than a half mile, and they were not away from home and no one was there who could convey the disease in any way that I could learn. I look upon it as a sporadic case.

Pulmonary Phthisis has prevailed to a small extent in this region but not so extensively as at some other points. Most cases could be traced back to some connection on one side or the other or both sides of the family, leaving no doubt as to the hereditary origin of the complaint.

A young and robust man left his father's farm and went to work in a box shop where there was much pine dust arising from the wood in the course of manufacturing. He came home at the end of three years and died of phthisis in a short time.

I look upon the breathing through the mouth as a frequent source of consumption.

Livermore Falls—HENRY REYNOLDS, M. D.

Typhoid fever has at times prevailed epidemically in Livermore Falls Village, but not since my arrival here three years ago. There are also the usual variety of lung troubles and other common diseases. Scarlet fever has occurred from time to time here during the past three years and in a large part of the cases it was impossible to trace the infection to others. One case would occur in one part of the village and perhaps none others, but after a few weeks, three to six, another case would occur in another part of the village. In some instances several cases would follow directly one after another, but many of them occurred in the peculiar way mentioned.

My little girl eighteen months old was taken with **Scarlet Fever** last May and had had no possible way of exposure that I could think of except having visited a home and room where two children had been sick with scarlet fever four or five months previously. In the room the lounge upon which the children lay when sick had not been disinfected nor had the room, and I think she took the disease from the lounge.

A seven-year-old girl of one of my neighbors had the scarlet fever, and six weeks after the baby in the same family had it. The little girl had been isolated as soon as she was known to have the disease and the house was disinfected after her recovery. Just before the baby was taken sick, some suits of clothing from Boston for use at an evening entertainment were brought into the house, and I thought the baby took the disease either from that clothing or else from some clothing in the house that might not have been thoroughly disinfected. Have known the disease to be communicated from one family to another by letter. I have not seen anything that would lead me to think that unsanitary conditions would originate *de novo* scarlet fever. I believe that the scarlet fever infection will remain in rooms and clothing for months and that it is due to this fact that many cases occur which cannot be traced to any distinct origin.

I have seen only a few cases of **Diphtheria** the past three years. Two or three cases occurred in a family from Bangor where the disease had been, who were visiting here. Another case occurred in a young man who had recently returned from the State Fair last fall.

In 1870 I was practising at East Wilton, a village built in around a mill-pond. The previous year the great freshet of 1869 had washed into the pond a large quantity of leaves, sawdust and mud, two or three feet deep. In the summer of 1870 the water was drawn off for repairs on the mills, and left the mud exposed to the hot sun. A disagreeable odor arose from the decaying mass and was blown over the village by the southwest wind which prevailed during several days. In the track of that wind from the decaying mud eighteen cases of **Typhoid Fever** occurred, all down at one time, in a small village of about fifty houses.

I know of a farm house where a case of typhoid fever has occurred each year for three successive years. There is an offensive privy in the woodshed joining the house, and the drinking water is obtained from a spring down hill from the buildings four or five rods. Sandy land.

I have known the scent from a privy where the evacuations of a typhoid fever patient were emptied to give the disease.

Pulmonary Phthisis is not very frequent in this vicinity. Want of ventilation is often a cause, especially where a large number live in a few small rooms. I have seen several cases where I attributed part of the causative influence to stagnant water in cellars, and dampness from the many trees close to the house. The bad ventilation of school-houses I think helps to induce phthisis in those predisposed to it.

School-Houses have no means of ventilation except by doors and windows. Seats are arranged so that the sun falls directly in front of the pupils instead of upon their books, making it hard for their eyes.

Lubec—H. S. DELAMERE, M. D.

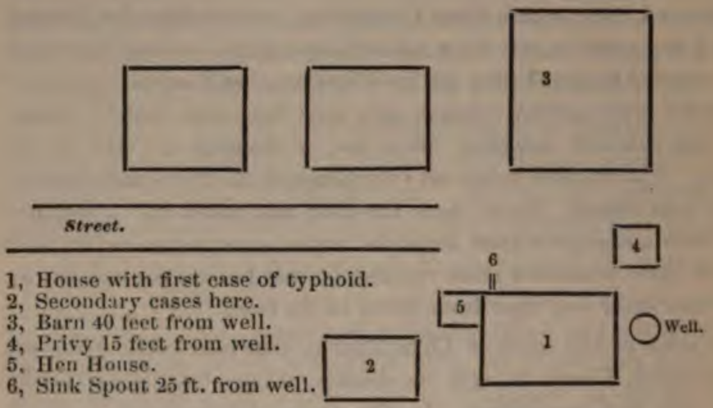
Since I have been here, phthisis, pneumonia and typhoid fever seem to have taken the lead.

Before I came to this State I treated a case of **Scarlet Fever** that I supposed to have been taken from a hack. About one week had elapsed from the time the hack had been used at the funeral of a scarlet fever patient, when a lady used the same vehicle, taking her six-year-old daughter with her, a distance of five or six miles. The weather being not very pleasant, the doors and windows were kept closed. In six days the child was taken ill. There had not been a case of scarlet fever for some years within seven miles of the place where the child resided, so that I could not account for it in any other way than from riding in the hack.

In some of the cases of **Diphtheria** that have come under my observation, I have thought the disease to have been generated by filth and bad ventilation. In the town of Yarmouth, N. S., I attended four cases of diphtheria all of which occurred in the same house and in the same family. I think the disease was generated by filth beyond the possibility of a doubt. The mother, a French woman, lived with her four children in the basement of an overcrowded tenement house. The inmates of the house were all washerwomen. In these premises there was the most perfect neglect of everything pertaining to cleanliness or dainage. The water in which they washed clothes, etc., was thrown out of the doors and windows until there was not a sign of vegetation around the house; in fact the house stood in the midst of a quagmire of filth. The French woman and her children were the only ones who slept on the first floor, all the others sleeping up stairs. Of those who slept up stairs none had the disease, whilst all of the children sleeping down stairs had it. The entire household had access to the sick-room until I was called in, which was ten hours before the death of the eldest girl. No one took the disease but those mentioned. One death, three recoveries.

I have thought that a number of the cases of **Typhoid Fever** occurring in this place were caused by drinking polluted water, there being five cases last autumn occurring in people who were using water from the same well.

Some of these lived in comfortable homes and others in a filthy, badly-ventilated house. The people generally don't pay any attention to the relative positions of wells and privies which is the cause, in my opinion, of most of the typhoid fever in this place. The pen sketch which I send will show their relative positions in the cases of which I speak.



1, House with first case of typhoid.
2, Secondary cases here.
3, Barn 40 feet from well.
4, Privy 15 feet from well.
5, Hen House.
6, Sink Spout 25 ft. from well.

The first cases (two of them) occurred in House No. 1, near the well, and later three cases occurred in house No. 2. The soil is gravelly and not very deep before the ledge is reached. The surface of the ground at the well is lower than it is where several of the neighboring privies are. I forbade the use of the water by the family in house No 2 when I attended, and afterward there were no new cases.

Compared with other places where I have been, I should say that **Phthisis** is frequent. As near as I can find out the principal cause is heredity. All my cases have been quite clearly inherited, generally from the mother. I think that where there is an hereditary tendency to the disease the bad ventilation of school-houses might hasten it.

Bad ventilation, bad seats and bad heating facilities in our **School-Houses.** Headaches frequent.

Lubec—E. H. Bennett, M. D.

The diseases most prevalent here are catarrhal diseases of the respiratory organs, consumption, pneumonia, typhoid fever, erysipelas, diphtheria, chronic cystitis, chronic nephritis, diabetes (both forms) together with the diseases of childhood and the various forms of chronic diseases. I have noticed no peculiarities in the diseases here except that typhoid fever is apt to spring up in different sections where there is no history of contagion from other cases. I know of one instance of the same kind regarding diphtheria. Never met with typhoid in the spring before this year. Have had no severe epidemics of **Scarlet Fever** since I came here nine years ago. Had a number of cases in 1876 and a few mild cases this summer. The disease has been spread this season by allowing those who have had it to attend school. [The parents claim they did not know it was scarlet fever.] The only epidemic of diphtheria which we have suffered from in the last decade was in 1881. I think it can hardly be said to be endemic here, but in 1881 the disease broke out in different parts of the town about the same time. In one instance there was no history of contagion from other cases. We usually have a few cases of typhoid fever in the fall. Unsanitary conditions are evidently the *indirect* cause at least, and if the disease germ can be multiplied outside the human body without seed, the *direct* cause. I believe we have mild epidemics of pneumonia and erysipelas. It is rare to meet with a single case, but they are usually in different families. I can find an account of only eight invasions of **Small-Pox**. In 1823 it was brought from New York. About 1838–40 it was brought by a sailor from New York. Within a period of two or three years, 1864–67, there were four distinct invasions, all brought by seamen. In 1869 it was again brought by a seaman. Was twice brought from Boston, others from New York. Probable cost to the town was $250.00.

As regards **Scarlet Fever** I have never known the contagion to have been retained in clothing more than a few months. Undoubtedly unsanitary conditions play an important part in retaining and multiplying the poison. I have *never* met with but one case where the contagion could not be traced to other cases, and here I questioned the correctness of my diagnosis. The case, however, was well marked; was mild form.

We had an epidemic of **Diphtheria** in 1881. I should say that contagion is the most frequent cause. In April, 1881, a boy ten or twelve years of age, who had had diphtheria in Boston, came here to visit some relatives. He went first to stop with his aunt. On Friday of the week in which he came she washed some of his clothing. The next week she was taken with diphtheria and it went through the family, four cases. Before the aunt was taken sick the boy went to an uncle's where he played with another boy about his own age. This boy also had diphtheria and there were three cases in that family. Other cases of contagion were just as well marked. The sanitary condition of these homes was fair.

I have met with cases of **Typhoid Fever** which could be accounted for only by the pollution of water by the leaching from sink drains, cess-pools, privy vaults, etc.

Consumption is quite frequent and the more frequent causes are contagion, bad ventilation, dampness, hereditary imperfections, anemia and all depressing influences. Pneumonia may result in "fibroid phthisis." Badly-ventilated school-houses are first-class nurseries for tuberculosis. I do not know of any cases where there were not other factors than unsanitary conditions, but bad sanitary conditions will certainly do much to fan the disease into active progress. When we find members of some family for several generations dying of tuberculosis as every physician of any considerable experience must see, I think we must conclude that the disease is in part, at least, hereditary; but such cases as the following seem to argue the infectiousness of consumption: In the summer of —— I was called to see Miss A. and on careful examination found unmistakable evidence of pulmonary tuberculosis. In spite of all treatment the case went on from bad to worse and the young lady died. During the daughter's illness her mother was her constant attendant; was with her most of the time and even slept with her a great part of the time. The mother belonged to a consumptive family, but at the time of her daughter's first illness was in very good health. Shortly before the daughter died she began to fail, soon began to cough, had obstinate diarrhœa and presented all the symptoms of consumption and died in the same year. I have always considered infection to have been the direct cause of the second case; but no doubt the system was in a proper condition to receive and propagate the disease. I have noticed other cases of similar character.

Our **Schools** are badly ventilated, badly heated, badly seated and have a detestable privy arrangement. Most of the teachers and scholars suffer from catarrhal troubles during the winter months.

Probably, at least 25 per cent are absent during some part of the term on account of sickness. Headache is a very frequent complaint with the scholars. If scarlet fever or diphtheria were to appear in the schools the first case would cause but little uneasiness; if several broke out in any district the school would be discontinued, but the school-house would receive no attention.

Lyman—E. HURD, M. D.

It is quite healthy at this time. A few cases of measles, tonsilitis and common "colds" are prevailing. We have our share of chronic diseases, asthma, rheumatism, etc. February and March of this year were noted for the prevalence of pneumonia and influenza, several aged people dying from the former. We have no cases of **Scarlet Fever** now, but during the past twenty or thirty years we have had several epidemics of this disease, sometimes of the simple type, and frequently of the anginosa and maligna; but few have proved fatal except in the last-named form. I have met with a singular coincident in one family, where a typical case of scarlatina anginosa and a typical case of diphtheria prevailed at the same time. I have always regarded the two diseases as distinct in most respects, scarlatina ranking among the most contagious of the zymotic diseases, so much so that it is next to impossible for an unprotected child to be exposed to it without taking the infection, while diphtheria can be visited by numbers of children or others and not contract the disease. Eruption, desquamation and sequelæ mark the one, while nearly absent in the other. I am aware, too, of the type designated scarlatina *sine eruptione*, **Diphtheria** has visited us very seldom since 1863, and when it has, it has been confined to one or two neighborhoods. In a few families it has proved fatal. In 1863 its ravages in this town were fearful. In several families all the children were swept off. In one family four children and the father died. The mother and one child survived. An incident in this family sickness should interest pathologists. The four children that died had the physiognomy of their father while the one that survived had the features and disposition of the mother. Two families residing on opposite sides of the street were attacked with diphtheria at the same time. They were treated by the same physician and with the same medicine. The children in one family, three in number, all died. Six in the other having the disease all lived.

The three that died were of the scrofulous diathesis; the six that lived were of the sanguine temperament.

I have known some and read of other cases where the infection of **Scarlet Fever** retained its vitality several weeks and even months in houses where the inmates had moved away after having the disease. I have not known an instance in which scarlatina has been spread by public funerals; still it is quite probable that no better place could be found to carry on the business. *Public funerals* should not be tolerated when this disease is prevalent. Nearly all, if not all, my cases can be traced to other cases.

I have some doubts of the contagiousness of **Diphtheria.** In illustration: A teacher left his school with diphtheria, went to his home, some three miles away, and soon died. Several in his locality died of the same disease. Not one of his scholars nor one in the district contracted it. The teacher's locality had been visited several years before by diphtheria.

I have in mind two families who were stricken with **Typhoid Fever.** One caused by a hog pen at the back part of the house, built there to receive the drainage of the sink spout; and all decaying vegetable and animal matter that could be collected were thrown into it. The stench was intolerable when doors or windows were opened on this side of the house. The whole family had the fever except an infant which was carried away during the sickness. All lived but the mother. The fever in the other family seemed to be caused by polluted water from the well, which was the receptacle of toads, snakes, surface drainage and other pollution.

Cases of **Pulmonary Phthisis** are not as prevalent as formerly; still we have occasionally persons dying with the disease. I think there may be an hereditary transmitted tendency and still the father and mother may live to a great age and die of other diseases, while their children may all die of phthisis. Sometimes this tendency is thought to leap over one or two generations and then show itself again. Observation upholds this idea I think. It is more to our purpose to know the developing causes, as the essential nature of phthisis is little known at present. Among the exciting or developing causes of the disease are a cold, damp atmosphere, sedentary habits, bad ventilation and over-work. The bad ventilation of school-houses is, I think, a prolific cause of the disease.

If a stranger should travel through our town he would say, "You have nice comfortable **School-Houses.**" Let him enter these houses to study the modern improvements in ventilation. He would say, "Why! where are your ventilators?" "Don't you see them, these doors and windows?" "Yes I see them, but do you not make the scholars sick by opening windows over their heads while in a state of perspiration from an over-heated room?" "Well, I think I see now why our children come home from school coughing and wheezing, with headache, and having to stay out of school several days to get well." A few years ago the teacher in district No. 7 was taken ill, carried home, and died in a few days. Bad ventilation and over-work played an important part in this case. Headache is a frequent complaint in our schools.

Machias—S. B. Hunter, M. D.

My experience with **Small-Pox** and vaccination is not large, but it certainly is worth giving for the benefit of my younger brethren. In 1858, Pinkham, a sailor, came home sick and was at home two days, during which time over thirty of his neighbors called to see him. His family consisted of wife and seven children, unprotected by vaccination. I was called the evening of the second day and found small-pox well developed in first period of eruption. I flagged the house, which was small and badly ventilated, notified the selectmen and instructed them to see every person who had been exposed and I would vaccinate them at once. I vaccinated the family, mother and children, in both arms, then looked over all the numbers who had been exposed, vaccinating in the same manner all those who did not show good evidence of protection, a good scar; I was obliged to be economical of my virus, for my supply was limited. The result was, Pinkham had severe confluent small-pox, his wife and five children escaping, the vaccine disease going through all its stages regularly, but the two younger children had varioloid, but not severely. The vaccination in the arms of the two younger children commenced the same as in the older, but did not mature regularly, yet it certainly did modify the disease; it was varioloid, not small-pox. Of the number exposed not one took the disease. The town was well vaccinated and the disease stamped out at once.

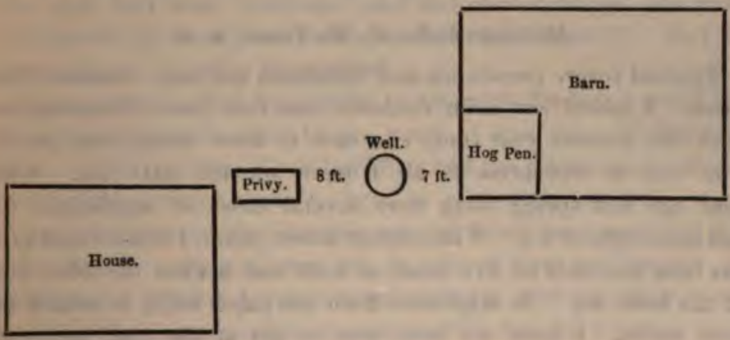
Later the same season, Hammond, a sailor, resident of Gouldsboro', came home sick with confluent small-pox and I pursued the same course with the same results. During the winter of 1861–62 small-pox broke out in the 7th Me. Regiment and I took the same course, vaccinating every man who did not have a perfect mark of a previous vaccination. The disease was stopped in a short time with but one crop of new cases, that is, only a few of those exposed to the first patient took the disease and none after the men were vaccinated. Can the protective power of vaccination be doubted in this case, where the conditions favorable for the spread of the disease were so great? I had the same experience in Machiasport, Northfield and Machias. In Machias the disease broke out in six families in consequence of the first patient having a light form of varioloid which was mistaken for chicken-pox. Soon as the nature of the disease was discovered it was arrested by vaccination. One thing must be remembered; we must not be in a hurry or too confident in our diagnosis when we are called to a supposed case of small-pox, varioloid or chicken-pox, although I never made a mistake in its diagnosis, yet I have seen my superiors do it. From the above hasty history of my experience in this disease you must see I am a firm believer in the protective power of vaccination. My experience with humanized virus is, that it is surer and the protection the same as animal virus. The danger of communication of disease by humanized virus cannot be denied, yet it is not great for I have not seen a case of syphilis conveyed in this manner in the thirty years of my professional life. At this time, when animal virus can be so readily procured, humanized should not be used.

Madison—A. E. Farnham, M. D.

The more prominent diseases are lung diseases, typhoid fever, diarrhœa and cancer. I have noticed that in hot weather and even after the weather was cool, that we had an obstinate bowel trouble to deal with. It certainly begins as diarrhœa, but in a week the discharges become bloody and ulceration of the intestine takes place. It is very obstinate and yields very slowly or not at all to treatment. I have had several fatal cases, and have it to deal with every season. I have had many prominent physicians in consultation but with no good results. No physician has been able to account for some of the symptoms and it is different from anything mentioned by our standard authors. When I was in India, seven years ago, I saw something like it which they termed "catarrhal dysentery" (Asiatic). It is not dysentery and far from our summer diarrhœa. Have only an occasional case of diphtheria or of scarlet fever, but considerable typhoid fever, which is often very severe.

Nearly every case of **Scarlet Fever** I have had, I have traced to contagion from clothing. In one case a little girl ten or eleven years of age took it from clothes sent home by an older sister who was at work in the mill at Lewiston. This elder sister had had scarlet fever some months previous to sending home the clothes. The little girl died. Another case I had—a little girl taken with her mother on a visit became weary and fussy, and to pacify her a doll was found in the chamber which five years before had been used by a little girl who died with scarlet fever. Said girl had her doll with her on the bed while she was ill, and after her death it was thrown into an old clutter room up stairs. This girl played with the doll and was taken sick with the disease in the course of a week or ten days. No other case within twenty-five miles then.

I have had several cases of **Typhoid Fever** which were due to bad water. I had in the town of Cornville, about a mile from my location, a family that were always ill. They never went a week for two years without sending for me. The family consisted of father and mother and four children, two boys and two girls. The mother was sick with pneumonia and after getting better had typhoid. She recovered from that only to become a victim to phthisis. Three of the children had diphtheria and the next summer typhoid fever. I began to look about for causes and found that the well was between a hog house on the one hand and a privy on the other.



There was a long shed connecting the house and barn, which I leave out to show the position of well and privy. So both well and privy were under cover. In one end of the barn, next to the house, was a hog pen. The top of the well was lower than both the barn and privy. The water, of course, became contaminated and no doubt caused the diseases. I should have noticed it before had all been open, but the old string of buildings were grim and dirty and I went into the house and never thought about the rest of the premises, till one day, when paying a visit, I was thirsty and asked for water. I did not drink it, for when near my nose I detected a bad odor which at once arrested my attention. I began to enquire and the folks confessed that it was "queer" but had always been good water and supposed it would pass off. I began to investigate and found out the facts and told them what to do. It was with difficulty that I got any change made. Finally, however, by aid of the neighbors, I made so much complaint and kicked up so much fuss that the matter was corrected. I removed a cancer from the father, which was caused by his boot chafing his foot. This was while the well was bad and he was constantly ill with catarrh and bronchitis. I had the cellar cleaned out and everything about put in a good sanitary condition and have had but two calls in as many years since. The family are as healthy now as the average, and the children would not be recognized from photographs taken when I first knew them. Another case of typhoid I found to be due to a bad drain and filthy sink spout.

The most common faults with our **School-Houses** are, the houses are small, poorly heated, have no ventilation unless a window is up or down and I don't call that ventilation. Cases of illness quite frequent and headache very common indeed.

Mechanic Falls—C. H. TOBIE, M. D.

Typhoid fever, pneumonia and diphtheria are quite common diseases. Typhoid has been epidemic here four years in succession until the present year (only one case in town during the year). One case of diphtheria is all I know of, the last year. One year ago last spring there were several cases of scarlatina. I had some eight or ten. Within about fifteen years, I think, small-pox has been here four or five times, at least that is what the older men of the town say. It originated from the paper mills, of which we have seven. I have not been able to get at the cost, not even approximately, but think $2000 would cover the cost.

Typhoid Fever often from unsanitary causes. In 1882, one day, visiting a patient sick with the disease, I asked for a drink of water. The taste and smell were so bad that I could not drink it. The people at my request cleaned out the well and found three dead toads in various stages of decomposition, also much decaying organic matter. I have also seen numerous instances where privy vaults, stagnant water, drains, etc., were in my mind the cause of the disease.

Cases of **Phthisis,** I think, are not so frequent here as they are nearer the sea shore.

In our **Schools** may be found lack of proper ventilation with dangerous contiguity of privies.

Millbridge—GEORGE GOOGINS, M. D.

The diseases which I find most frequently are influenza, bronchitis, typhoid fever, diphtheria, common sore throat or tonsilitis, and pneumonia. In the thirty-five years which I have lived here there has been three periods of epidemic scarlatina. The first and most extensive was 1850–51. More than three hundred cases then came under my care. Again, in 1868, not so extensive, till the fall of 1869, when some twenty cases with but one death; also one in 1868. Again, in 1874–75, more fatal. Had some sporadic cases all along. In 1882–83 had eleven cases in two families, no deaths. **Small-Pox** we have had three times. The first time in 1852, brought here by a visitor; no other cases of the disease. Cost to town, $75. Second time in 1864, brought by sailor from Boston, and had seven cases, no deaths. Cost to town, $300. The third time in 1873; brought by sailor from Boston and he communicated it to his family. The man had been vaccinated and had only varioloid, but three members of his family had small-pox and three varioloid. Had the latter myself. Cost to town, $500.

I was called in 1875 to a family in Cherryfield where I found two girls, one seven the other twelve years of age, sick with **Scarlatina.** They could hardly believe they had the disease in the family as they had, as they thought, kept so completely isolated. I enquired very particularly into this case as I had been asserting that there must be contact in some way in order to have the disease. At first I began to think I should have to give in, and not explain any way that the poison could be communicated; but, upon asking them about their washing being done, I learned this: Mrs. B—— was afraid to have her wash woman came to the house, as she had been in cases where they had scarlatina, and so sent her clothes to her home to have them washed and ironed. These two girls were the only ones that the clothes were put upon at this time and both were taken sick at the same time. The woman had washes from families where the infection was and mixed them together. Afterwards other members of the family had the disease as taken from them.

Case II. About this time I was called into Steuben to see a little boy with the sequelæ of scarlet fever, who afterward died. Whilst he was sick he had his books on the bed with him and after his death no other cases occurred in the family or neighborhood. The house was very thoroughly cleansed and everything thought safe as far as the disease was concerned. Some four months had elapsed when, the schools commencing, a little girl of one of the neighbors was given the book that the boy had used while sick. She was taken with scarlatina and died in a few days. The poison was in the book that had not been cleansed.

In May, 1874, some men by the name of Abbott, belonging in Beddington, came from New Hampshire where they had been engaged in the woods for the winter and coming out in the spring had been subjected to and had the scarlet fever. As soon as they were able to travel they left for home, without being perfectly cleansed from the disease. They stopped over night at a house between Millbridge and Cherryfield, where they left the disease. The next day they went home and had enough of the poison left to give to their own family. One little girl died, but as it was a very sparsely settled community no other cases occurred. In April, 1875, Mrs. Abbott was engaged in making a rug and one of her neighbors came in to help her and brought a little child who played on the floor with the rags that were being used, among which were some night-dresses that were known to have been used at the time of the girl's sickness. In less than two weeks the child died of scarlatina. No other cases in the place.

Case IV. In January, 1876, the family of Judge Milliken, among whom was the Doctor, were sick with scarlatina. I attended them and many other families at that time in Cherryfield for the same. Mrs. F. came to me and said, "Dr., I have had the rash. My brother is sick with it and I want to visit him, but my neighbors think I ought not to go as I have a large family of children who never had the disease. Do you think there would be any danger?" My answer to her was not to go, she might carry the infection in her clothing to her family. She disregarded me and went, not wearing the same clothing at home. She had had the simple rash in her childhood, but not the sore throat; this she contracted and gave to her children who had the scarlatina maligna, and three out of six died.

Case V. Capt. David H. Wilson, of Millbridge, who some years before had lost all of his family with the diphtheria, was very much alarmed about this rash, as he had three small children. He lived some ways from any neighbors and four miles from the village. I was called to his house March 3, 1876, where I found two children sick with the rash, as I pronounced it. He thought it could not be possible, as he had kept them so completely shut up for the winter, and I thought I should be puzzled to find where the infection came from in this case; but after close inquiry I learned the following facts: Capt. W. had been from home and stayed away over night, had been in vicinities where the disease had been for the winter. He came home and had sore throat. Not having any rash he thought it merely a cold, but the poison was there and the children took it, and were very sick, but all recovered. No other cases occurred in town.

My first case of **Diphtheria** commenced September 8, 1861. This I claim to be the first case of this disease east of the Penobscot River. If there were any previous I would like to know it. The history of this is as follows: September 8, 1861, I was called to E. M., aged six years, having what I called the croup. I treated her with warm baths, tartar emetic, etc., and succeeded in relieving her till the next night, it came on again, and the same treatment followed, continuing nauseating doses of ipecac through the day. The child recovered but was unable to speak aloud for three months. On the 24th I was called to F., aged four years, sick with sore throat. Her mother then told me that E. had had a sore throat before they called me and asked me if I did not think it might be the new disease, which we had been reading about. I examined the throat and immediately pronounced it to be diphtheria. I had no treatise on it whatever, not a book that I had ever seen mentioning such a disease. This child died. Two others of the family were sick with the same, but recovered. This place was perfectly dry and neat, no water ever standing in the cellar or any dampness around the premises. Neat and clean inside. Diphtheria had come more than a hundred miles and lighted there. My next cases were, January, 1862, R. N.'s family were attacked. One mile from M.'s and no communication between the families as I could learn. Three cases here and two deaths. This was not a place of model neatness, but the weather was cold and everything frozen up. About one-half the family were attacked, and I, myself, took the disease, and was sick with it in my family of small children, and my wife and myself only were sick with it. Two years after, the children were attacked when there were no others sick around there. One died out of four that were sick and one escaped the disease. During the years 1863–64–65, the epidemic prevailed throughout this region. Epidemic I say as it certainly was more than contagious. I noticed that the weather had much to do with its spread; cold evidently favoring its production. A number of days of mild, fair weather and not a case, but a cold storm was sure to bring it along. Islands and sparsely-settled districts suffered more than the villages. One family lived on an island three miles off our harbor, consisting of Capt. W., wife and two children. The man was so afraid of the disease that he would hold no communication with the main-land for months. In the spring of 1864 he came off himself, what was left of him, having buried his family on the island. This is only one instance of many that occurred in my practice. After 1866, for eleven years, not a death from diphtheria in Millbridge. Sporadic cases and of a mild form only. In the fall of 1877 it came back again as an epidemic and for two years it raged in our town east of the river, not a case existing on the western side for this time, unless it had been brought over and then did not spread to any others. In the spring of 1880 it was the most fatal here according to the number of cases of any time during its existence, but not a death since and but few cases.

Moose River—J. B. THORNTON, M. D., U. S. Sanitary Inspector.

During the last few days I have attempted to comply with the request of your Board in regard to making out a report somewhat historical in character, of past appearance of zymotic diseases in this region. I have found it an utter impossibility to do this with any degree of accuracy as I have had to rely entirely on the somewhat rambling statements of the laity, mostly in the persons of old ladies, there having been no physician here for a great many years until very recently: so please receive following figures as only approximate and subject to modification. I find this region to be peculiarly exempt from febrile diseases, there having been only one case of typhoid fever ever known here; a former customs officer died from that disease in 1870. There is a history of childhood diseases in about the same proportion as in other localities with one exception, viz: **Scarlatina**; as near as I can discover this disease has appeared twice in a period of forty years or more: once in 1874, during which year there were fifteen cases with four deaths; and in 1855, when there were five cases; all recovering.

During a period of fifty years **Small-Pox** has visited this region twice: the first appearance was in 1846; a family of seven persons living at Parlin Pond were all taken down at the same time, all recovering but being disfigured. Again, in 1868, it appeared at Sandy Bay, near the frontier line, when it was imported from Canada; two cases, both fatal.

Diphtheria gives us a history of frequent appearance. In 1863 there were four cases in Moose River Plantation, with one death; at the same time there were many cases at the Forks (head waters of the Kennebec River). Eighteen hundred and seventy-six brought thirty-five cases with nine deaths, whole families being exterminated. Diphtheria again appeared here in 1879, when there were twenty cases with ten deaths; again in 1881, five cases, all recovering (doubtful). In 1885 there was one death said to be caused by diphtheria, at the same time there being quite a number of cases of sore throat which some pronounced diphtheria (?). In regard to the cause of these repeated visitations of diphtheria no explanation has ever been given and I woud have it understood that the above figures are only approximate.

It is no exaggeration to say that 99 per cent of the people of this region are afflicted with the "New England disease" catarrh of the head, a chronic catarrh of a severe type affecting the nasal and faucial mucosa throughout; each throat is like any other and its owner is subject now and then to attacks of acute tonsilitis and diphteritic sore throat, both diseases occasionally taking upon themselves an epidemic character and especially is it the latter which I think is frequently confounded with diphtheria proper by hasty and superficial observers. There really seems to be the formation of a more or less dense membrane and occasionally quite emphatic constitutional disturbance, but patients quickly recover and there are no serious sequelæ. Climate, hardship, exposure, evil habits, poor ventilation, country bed-rooms leading out of the kitchen, lack of soap and water, scanty fare, proximity of water-closets to culinary department, imperfect drainage or none at all, abuse of stimulants and tobacco, lack of mental and moral discipline and too much bodily, I consider good and prolific causes of the general condition.

Monmouth—E. P. MARSTON, M. D.

The prevalent diseases are diseases of the lungs, fevers of a mild nature, rheumatism to some extent and dyspepsia. We have had no epidemics of late years.

Diphtheria has been quite prevalent here. The cause is most often contagion, the system being in a susceptible condition.

In Hanover, N. H., **Typhoid Fever** has occurred several years in succession. The water is poor and the drainage also.

Phthisis occurs quite frequently. A hereditary constitution is transmitted. A bronchitis is developed and in a few years a phthisis is the result. Ventilation is usually good here and has much less to do as a cause than dampness. The latter is more common and is less easily avoided and is an important exciting cause in our latitude. Inperfect ventilation of school-houses has not much to do with the causation of the disease in this part of the State.

Our **School-Houses** are not evenly heated. A scholar sitting very near the stove has, to my knowledge in several instances, taken cold upon leaving the room. The school-room should be thoroughly disinfected or closed in case of the occurrence of scarlet fever.

Monroe—JOHN J. SEWALL, M. D.

In the past year, from December, 1884, to March, 1885, pneumonia was very prevalent. Cannot learn that there has ever been an epidemic of scarlet fever in town. I had two cases in the month of April, last. In these the disease was contracted by a little girl who had been visiting friends in another part of the State. **Diphtheria,** of most malignant character, has twice visited this town within the last seven years. In the autumn of 1878 it broke out in what is called the Centre District. The topography of this part of the town is particularly rugged. Quite a stream of water flows through it, but nowhere is there stagnant water, nor is there much of any swamp land. The nearest approach to it is a large meadow about a mile above where the disease first appeared. In this epidemic twelve children and three adults died. The disease confined itself wholly to this district. Was first endemic. About three years later, in latter part of winter of 1881-2, the disease appeared in the Village District. This is about two miles from Centre. Land is considerably lower and more level than Centre. A rather low, and in some parts, sluggish stream flows through the village. Seven of the village children died. About a month after the appearance of the disease in the village it broke out in the north part of the town, two children dying; and a little later a single family was afflicted, two children and the mother were victims. Neither of these places were nearer together than two miles. Cannot learn that **Typhoid Fever** has ever been epidemic in this town. **Small-Pox** has appeared once within the last twenty years. It was brought here by a lady from Boston. About $500 was the cost to the town.

Our **School-Houses** are not properly lighted and ventilated.

Monson—C. C. HALL, M. D.

Our most frequently-occurring diseases are diphtheria, pneumonia, rheumatism, phthisis, dysentery, cholera infantum and typhoid fever. Occasionally cerebro-spinal-meningitis breaks out; several cases have appeared lately. The peculiarities in the diseases here are that in typhoid fever we do not get a distinct eruption, only a few isolated spots and do not get much eruption in cerebro-spinal-meningitis. I have met quite a large number of cases of membraneous croup, typical cases, and have observed that simultaneously, or very soon after, typical diphtheria developed in the vicinity. **Diphtheria** has prevailed epidemically and endemically for a great many years. My experience has led me to consider it a very contagious disease and transmissible by fomites. There have been two epidemics of scarlatina in ten years. **Typhoid Fever** has not prevailed here, with exception of a very few isolated cases, for ten years. Its absence is probably due to good drainage, about which our towns people are very careful and intelligent, and the fact that it has not been introduced. **Small-Pox** has never invaded this town to my knowledge. It has been in Blanchard and Shirley, adjoining towns, once or twice. At Blanchard I think a soldier came home during the war and had the disease. No other cases. At Shirley it was brought to the hotel by a woodsman who had some clothing washed by the washer girl who was the first victim. It was spread generally through the town, suspending business for a whole winter.

Have known a physician to spread **Scarlet Fever** by visiting families miles apart and not changing his clothing. We do not permit funerals after death from scarlet fever or diphtheria to be attended by youth, and instructions are always given to prevent spread by fomites.

Diphtheria has been very prevalent. In my opinion the causes must be climatic here. We have dry cold weather during the winter as a rule, with an occasional moist or foggy day. It has prevailed more extensively in late fall and winter. Has often broken out during or following a damp day with sudden change to cold. Has usually originated along the bank of a stream or pond, but has not been confined there. Has been more contagious among the poorer classes with unsanitary conditions.

About five years ago this winter we were entirely free from the disease. There were no cases anywhere about for miles.

A workman here was sent for by his family, twenty miles or more away, as they had diphtheria. He went home and nursed several children and his wife through the disease. One child died. A short time after they got clear of the disease he returned to this town wearing the same clothing which he wore while holding his children. He boarded in a family who had four children, one a child about one year old whom he was accustomed to hold and amuse considerably. This baby and one other child were taken with the disease in a malignant form in about two weeks after his return, both died. The other two were taken a few days later, but recovered. No other cases occurred in the village. Two or three weeks later an old lady from this family visited relatives three miles out of town, where there were four children. In a week or two (not more) those children all had the disease, one dying. No other cases occurred in the vicinity. A few days later this same old lady went thirty or forty miles on the railroad to visit friends where there were children. Several had the disease, one died. No other cases anywhere about nor had there been for years. Diphtheria invariably spreads in our schools if they are allowed to continue. We have learned to stop all schools and carefully isolate every case as we would small-pox. Have known physicians to spread diphtheria by not changing their clothing and using other precautions.

I have known many instances in which **Typhoid Fever** was produced by unsanitary causes. For several years the disease prevailed extensively at Greenville, a village fourteen miles distant on the shore of Moosehead Lake. Several deaths occurred. In that village there was a flat swamp into which privies, sinks, etc., drained. The swamp was settled by French people whose privies were never cared for. At high water they were overflowed. Sinks and wells were in close proximity, cellars neglected and under-ground sink drains stopped up for years, returning such stenches that people would get up from their beds at night and plug the pipe.

In a house where a family of three had typhoid fever at same time, and one or two nurses later, the well was under the house and the sink was directly over it with cess-pool just outside and running under the house and into the well. All through town where there were cases there were found very bad arrangements. I caused the local town officers to compel people to clean out drains, dig up sewers, fell and burn the bushes on the swamp land and dig a deep drain directly through the swamp, completely draining it and preventing overflow at high water. Since this was done very few cases have occurred where I had at one time fifteen cases in a village.

Cases of **Phthisis** are not very frequent. Measles, improper clothing, bad air and bad food, irritating gases and dust, over-work—anything which lowers general vigor or vitality for a long time, may be the cause of consumption. My observation has not confirmed the belief that it is hereditary. We had several cases immediately following an epidemic of measles. Badly-ventilated, dark and damp rooms, especially sleeping rooms, conduce to the disease.

A woman fifty-three years old was taken with tubercular disease and was cared for solely by a daughter twenty-two years old, fleshy and healthy. Soon after her mother's death she began to emaciate, cough and have hemorrhage precisely as did her mother. She was cared for by another sister who was plump and healthy. Immediately after her sister's death she too coughed, emaciated, had hemorrhage and died. All three within four years. The disease was not inherited by the mother. The girls were mill girls accustomed to mill air. A few cases have occurred here from effects of using high explosives in slate mines (nitro glycerine).

Mount Vernon—S. Burbank, M. D.

The prevailing diseases are fevers, erysipelas and a variety of other diseases. We have had no epidemics and no small-pox for thirteen years.

The worst thing about our **School-Houses** is the smallness of the rooms and the want of ventilation.

Naples—C. Y. LORD, M. D.

The prevailing diseases are rheumatism, phthisis and other lung troubles. There has been no epidemic of scarlet fever or typhoid for the past ten years. About three years ago there was a light epidemic of diphtheria. There has been no other epidemics here since 1875, when measles prevailed. Twice we have had small-pox. It first appeared forty-eight years ago, brought from Boston; the last one occurred sixteen years ago, brought from Montreal.

Scarlet Fever was brought from Portland by a lady through the medium of her clothing and communicated to her sister's children; also a lady brought it from New York and one person took it from her. I never allow a public funeral after this disease.

I had about twenty-five cases of **Diphtheria** three years ago and in almost every case the houses were very filthy, inside and out. It was spread at that time through two schools, but all the children that took it had filthy surroundings at home. I never allow a public funeral in such cases and therefore have not seen it so spread.

Almost every case of **Typhoid Fever** I have ever seen I think was due to unsanitary conditions.

Cases of **Phthisis** are quite frequent, usually the result of hereditary predisposition. I have two cases of phthisis in mind that I know were caused by want of ventilation and any amount of filth.

Faulty ventilation in our **Schools**. I have known a great many cases of illness due to faulty heating and ventilation. Much headache. One particular school-house is noted for unhealthiness. The room is very low and the stove funnel passes directly over the pupil's head and no means of ventilation but open windows. The floor is full of cracks and the house not underpinned or banked up.

Newfield—I. M. TARFTON, M. D.

Lung diseases are the most common. We have had no epidemic of scarlet fever or diphtheria since I commenced practice twenty-nine years ago. We have had but two or three cases of typhoid for about seventeen years. **Small-Pox** has appeared twice, imported from Boston.

Cases of **Consumption** are frequent. Scrofulous diathesis with sudden climacteric changes.

Our **School-Houses** are badly ventilated and have uncomfortable seats and other faulty arrangements.

New Gloucester—J. I. STURGIS, M. D.

During the winter and spring months, bronchial and lung troubles are prevalent, but we are unsually free from epidemics of typhoid fever and diphtheria. Few cases of scarlatina, diphtheria or typhoid fever have occurred in town during my residence here. We have had no small-pox in town for thirty years. One case occurred at that time in the family of Shakers; infection believed to have been brought in broom-corn used by them for manufacture of brooms. One case previous to this; cause or circumstances not recorded.

I recall the case of a little girl, living in a retired situation, with apparently no possible chance of direct exposure to the **Scarlet Fever**, who stood beside a lady while she read a letter from a family suffering from scarlatina. In a few days the child was stricken down with the disease. A family moving into a house where scarlatina had prevailed a year and a half before, were infected with the same. I do not believe that unsanitary conditions can cause scarlatina, *de novo*. Scarlatina is, I believe, always dependent upon a poison, *sui generis*, which must be derived directly or indirectly from other cases; owing to extremely contagious nature of disease it is difficult to trace to source.

Diphtheria has not prevailed to any considerable extent in New Gloucester. Contagion and unsanitary conditions are the usual causes. Severe epidemics of this disease in neighboring towns have fallen under my observation. There was a recent case of a little boy, in the town of Durham, who made a severe cut in his foot. A physician called to dress the wound who had diphtheria in his own family. In two weeks from time the wound was dressed, I was called to see the child and found him with diphtheria. All the other members of the family, six in number (father excepted), were stricken with the disease in from one to two weeks, also two neighbors who assisted the family. The surroundings of this family were highly unsanitary. Public funerals have not been permitted in any fatal cases coming under my care.

Typhoid Fever is an infrequent disease in this locality. Most cases have been isolated. In cases where the disease has spread through families the conditions have been unsanitary. We have in the village abundance of cess-pools, sink drains, privy vaults, &c., but no typhoid fever.

Pulmonary Phthisis is not rare in this locality. Inherited tendency is the prevailing cause. Have no doubt that imperfect ventilation, dampness and want of physical culture are important factors in the development of this disease. I have now under my care a young man (a victim of phthisis) whose parental grandparents died of the disease, numerous uncles and aunts on paternal side, and the father himself is a victim. Six brothers and two sisters of the young man have already died of the disease. The mother's family were free from any tendency to the disease, but the mother, after having cared for six of the children through the course of the disease, herself fell a victim, through infection, as was supposed. Many cases less marked, show heredity to be a most frequent cause.

All our **School-Houses** are poorly ventilated; many improperly lighted. The unsanitary conditions are, in most cases, not sufficiently marked to produce noticeable results. It is difficult to get statistics showing percentage of absence on account of sickness. Would it not be well to have this question inserted in the school Register which teachers are, by law, required to fill out? We have the advantage of the "town system," and consequently better school-houses than the average found in the country.

Newport—B. PORTER, M. D.

For the last twenty-five years none of the diseases mentioned have raged epidemically except diphtheria at its first invasion, and then it was terrible; a large percentage died. For about two years I cannot recall a single day but what I treated cases of this disease. But then we knew but little about it and used inert and useless disinfectants and no isolation. Small-pox has been here but once. The disease was probably contracted in the cars. About twelve years ago I vaccinated every person in town, and successfully too; virus from Dr. H. A. Martin, Boston, Massachusetts. The only invasion of cholera I know of was in Bangor, and I saw the second victim, a Dr. Wilson.

Some three or four years ago, in the town of St. Albans, a family of several children, living on a cross road some one-half mile from any other family, were snowed in so that there was no visiting for a long time and no **Scarlet Fever** anywhere about. This disease broke out in a boy in a severe form, and the only thing I could learn there was, about a week previous the children's bed had been moved into another room, and scarlet fever had been in this house years ago. It either came down out of a clear sky or it had lived here all this time. But I have seen it break out in this unaccountable way in other cases.

Diphtheria has been quite prevalent here. Apart from a "general predisposing condition," I think those in houses in damp localities and poorly ventilated have fared worse, yet I have seen it about equally fatal on the highest hills, and the best air and purest water. In 1876, my son contracted this disease in severe form and at the time my wife's sister was visiting us with a little child and stayed several days. After going home, some twenty-five miles, the child came down with the disease and died. Then soon another child died with the same; and a third one had it, but lived. There was no diphtheria in her vicinity.

Cases of **Phthisis** are quite frequent. Apart from heredity I should class dampness and improper clothing as the more potent causes. Little, dark, pent-up sleeping rooms have something to do in the same direction. I have seen victim after victim fall from infection. I am a firm believer in it.

In our **School-Houses** bad light first and then poor ventilation are the faults. Considerable headache.

North Berwick—J. O. McCorrison, M. D.

I find catarrh, influenza, bronchitis, pneumonia, quinsy or tonsilitis, rheumatism, some typhoid and the epidemic diseases of childhood more frequently than others. Small-pox has been here only once to my knowledge. It entailed only a trifling cost to the town, not more than fifty dollars. It was brought into town by a tramp.

I have observed cases of **Scarlet Fever** in which the contagion was carried in clothing from one town to another. I have known the contagion of this disease to be retained some time in houses, and I have also known this disease to have been spread by public funerals.

Diphtheria, so-called, occurs quite often, but in my opinion diphtheritic in nature rather than true diphtheria. Most of the genuine cases coming under my observation have been in the town of Wells, which joins North Berwick, near the seaboard. The causes appear to be filth, bad drainage, bad ventilation and poor water. It made its appearance in one family in Wells where eight or ten ate, drank, lived and worked in one room.

In our **Schools** over-crowding and improper ventilation prevail. Headaches are common, and colds, influenza and throat affections come from the crowding and over-heating of school-rooms.

North Waterford—F. C. CLARK, M. D.

I have been in my present location for the four years past, and during that time we have been very free from anything in the nature of an epidemic. I believe that a not very extensive epidemic of measles in the town of Stoneham is the only one worthy of the name.

Two years ago last spring I was called to see a child about two years of age who was suffering from **Scarlet Fever.** As this was an isolated case I was anxious to find the source of contagion, and my enquiries elicited the following facts: Three years before, the older children had had scarlet fever, and the mother had used an old woolen shawl to wrap them in. This shawl was put in a closet with a lot of rags that she was saving for the purpose of making a rug. Just before my patient was attacked these rags and the old shawl had been taken out of the closet, and the little child had been allowed to play with them on the floor. This was the only source to which I could trace the attack.

[In answer to enquiries of the Secretary, Dr. Clark gives the following additional particulars about these cases.]

The two cases of scarlet fever mentioned are the only ones that have occurred in the town of Stoneham during my stay at Waterford. There were no cases in the family or neighborhood during the interval mentioned. There was no other source of contagion to which I could trace these cases. The shawl had lain in a close closet for that period in a pile of rags. The appearance of scarlatina in the family as soon as these were disturbed points very strongly to the old shawl as the infecting agent.

My experience with **Diphtheria** has been limited unless every case of sore throat with exudation is to be so considered.

Typhoid Fever is, with me, a rare disease. Have one patient convalescing at the present time. Cannot trace the cause to any unsanitary condition.

Norway—F. H. TILTON, M. D.

We had a few cases of **Diphtheria** in 1880. The causes have usually been from filth. Cases of **Typhoid Fever** have occurred here from unsanitary conditions, and in one home cases appeared for two successive seasons. Then a thorough renovation was made. **Phthisis** is very prevalent, due largely to faulty ventilation, exposure and unsuitable clothing. In reference to the infectiousness of phthisis I would say that I know a whole family of children who, as soon as they arrived at mature age, went into consumption and died. There was no history of this disease in the parents.

Our **School-Houses** are too small and are badly heated and ventilated. Headache troubles much. I have never known of a teacher's death, but have seen them fade rapidly under their work in some of our rooms.

Oakland—D. E. PARSONS, M. D.

Among the prevailing diseases should be particularized consumption and bronchitis. We had severe epidemics of diphtheria in 1861 and again in 1877. **Small-Pox** invaded this town once before I came here. Cases of **Phthisis** are frequent. The causes have seemed to be very often heredity and dampness, and it has been an opinion of mine that the disease has been communicated from one individual to another.

The most common fault in the **School-Houses** in our town is the want of ventilation.

Oxford—O. STEVENS, M. D.

Rheumatism and dyspepsia occur quite often. There have been no epidemics lately. Once small-pox invaded the town. Cost about $150.00.

There has been but very little **Typhoid Fever** in this town.

The most common fault in the **School-Houses** in our town is bad ventilation.

Parsonsfield—J. W. DEARBORN, M. D.

For the past seven years there have been very few cases of typhoid fever, last year not a case; but few cases of scarlet fever; more diphtheria. Lung fever is quite frequent, also there are a large number of consumptives according to population.

Diphtheria has usually gone through a family when it has appeared. One family of eleven has had the disease twice within the last seven years; eight sick at a time; no deaths. It has usually appeared in several families at nearly the same time, apparently more due to atmospheric influences than contagion. In an epidemic that occurred in my practice in New Hampshire, on a high elevation of land, there were some six families attacked with diphtheria on a road about two miles long, within forty-eight hours of each other. Several died; those that were well nursed and cleanly as well as those the opposite. Yet, as a whole, uncleanliness and bad air are very unfavorable. In some families where I practice where the soil is porous (no hard pan), letting the water through it easily, I invariably find it sickly and the water of a poor quality. North Shapleigh is a village of this kind; the water supply contaminated by sink slops, privy vaults, etc. We find there diphtheria, fevers and all diseases of a worse type than in this town. Also in Freedom, New Hampshire, there has been more typhoid fever during the last twelve years than in any other town of its size within my knowledge. A hilly ravine, through which runs a small or large stream of water, according to the dryness or wetness of the season. When dry there is left decaying vegetable matter, from which source it is supposed, by some of us, the infection comes.

In regard to **Consumption,** I have seen several cases where I have been satisfied that they were produced by contagion. I am a firm believer in its contagiousness.

A young lady who was soon to be married, was seized with a cold which soon run into well-marked phthisis. During her sickness she was very attentively cared for several months until her death, by the young man to whom she was engaged. He belonged to a family in which consumption had never occurred, at least for two generations. Soon after her death he had a cough very like her's and lived but a few months.

I can cite several of these cases that are very convincing. Of its hereditary tendency I have no question. I have known of several families where all the members have gone with it. One of three brothers and two sisters, none dying under twenty years and none over forty. Another where mother and two sons and two daughters all went out, some where they have lived far separated, where contagion could not exist. I believe the close air of sleeping apartments, the unhealthy condition of school-rooms and the ill-ventilation of churches as well as dwellings, tend to produce this disease, but above all, the inattention to personal cleanliness as an existing cause or producing cause exists. With cleanliness, good air, wholesome and nutritious food and a proper amount of exercise, thousands who die with phthisis might live on for years and thousands might escape it altogether.

In regard to **School-Houses** and the pupils who are sick I find that headache, lassitude, restlessness, pallor, loss of appetite and loss of flesh are the symptoms of many; and there is no doubt that the bad air and general uncleanliness of place and also of the children are the causes.

Patten—F. F. BIGELOW, M. D.

The diseases which I more frequently find are those pertaining to the throat and chest. Some twenty years ago quite an epidemic of scarlet fever; since then it has been endemic several times when there would be perhaps but three or four cases. Diphtheria occurred in the form of an epidemic about twenty-three years ago; since then it has been endemic once or twice, but owing to greater precautions (so the people think) being taken to prevent contagion, it did not become epidemic. As regards this town itself, typhoid fever is almost unknown; never been epidemic. As far as I can discover, small-pox has been here but twice. It was brought from Canada; did not extend beyond the original case in either instance; probable cost $25.00.

The following case shows that clothing may for a long time retain the poison of **Scarlet Fever**: A child died of this disease and its clothing was packed away and left for a year, then unpacked by the mother who was taken soon after with scarlet fever, although she had not contracted it in the previous instance.

No one seems to know what was the cause of the terrible epidemic of **Diphtheria** which prevailed here twenty-three years ago, but as far as I can gather, it was from a lack of sufficient sanitary measures, and it extended for want of care in preventing contagion.

In this place I have not seen cases of **Typhoid Fever** which were evidently due to unsanitary conditions, but while connected with a public institution in a city of some 7000 inhabitants, we frequently had cases considered to be due to such causes.

Phthisis is rare in this country. As a cause of this disease I should say first and foremost stand hereditary predisposition, then poor sanitation. I think it sometimes occurs in those having no constitutional taint after a pneumonia. I feel assured that both imperfect ventilation and dampness play prominent parts as secondary causes. As to the question whether the bad ventilation of school-houses has much to do with causing consumption I would answer, theoretically, yes; especially as a secondary cause acting on those with a tuberculous taint or on any with a naturally weak constitution from any cause.

A lady died of phthisis ten years ago; since then two daughters have died; and a third, although the greatest possible care has been taken to preserve her health, is but little better than dead.

A young man, whose grandparents on his mother's side both died of phthisis, died at the age of twenty-eight, of phthisis, after the usual course of pulmonary hemorrhage, etc. One sister of his is now dying of consumption, and another, although able to attend to the duties of life, has a pulmonary weakness which shows she has the same tendency, and it only requires the proper conditions to light up the disease. The mother, however, is a woman of sixty odd years and is apparently as healthy as most women of her age.

The most glaring fault in our **School-Houses** is a lack of sufficient, or perhaps I should say proper, ventilation, as some of the pupils know by experience, especially in winter, there being at that season too much ventilation; however, this will be remedied in one or two of them by replacing them with new buildings. There have been some complaints from parents that their children are troubled in school with headache.

Penobscot—E. A. SPRAGUE, M. D.

Catarrhal diseases are the prevailing ones. In pneumonia and influenza, prevalent in winter and spring, the cerebro-spinal nervous system seems much affected, and there were more than the usual number of bowel and stomach complications. The inhabitants make no mention of **Diphtheria** except in one case. A corpse was brought home and several cases were infected from that, all fatal. I have had but one case in the last four years. There was an epidemic of scarlet fever about six years ago; it carried off many children.

The faults in our **School-Houses** are that the light falls sideways on the desks, outer doors open directly into school-room, cellars are damp, and the rooms are improperly heated. Many of the pupils every winter are sick from colds taken in school-room, and two years ago last winter the teacher at the Cove was sick. Headache is frequent, more among the girls. The school would be closed and the proper disinfectants would be used if scarlet fever or diphtheria should get into the school.

Phillips—L. E. Quimby, m. d.

During the past three years we have had a few cases of typhoid fever, four or five cases of diphtheria and quite an amount of pneumonia and bronchial difficulty. During the winter of 1885 we had a large amount of erysipelas, it seemed to be epidemic, in as much as the only cause assignable was the very sudden atmospheric changes. It affected rich and poor alike and did not seem to be caused by any unsanitary conditions.

During the autumn of 1884 there were four cases of **Typhoid Fever** in a tenement house, which I think were caused by impure water. The well was in a low, sunken place, receiving all the wash from the house and out-buildings, and in close proximity to the privy. They have since provided a well on higher ground, furnishing an abundance of good water. This year there has been no recurrence of the disease.

Pulmonary Phthisis is a frequent disease in this section.

The greatest and most common fault in our **School-Houses** is improper facilities for heating and ventilation. In the most of the school-houses the stove is placed in the front part of the room, near the teacher's desk, with the pipe extending to the back part of the room and usually over the center aisle. The result of this is cold feet with heated heads. For ventilation the doors and windows are opened, always to the danger of the pupils from taking cold.

Last winter I was called to attend three boys of the same school who took cold at the same time by the teacher opening a window where the wind could blow on their backs and heads. Two of the boys had pneumonia and were confined to the house four weeks, all caused by exposure to a cold draft in an over-heated room and for the want of proper ventilation. Headache is a very common complaint with scholars attending our winter schools, and the cause is almost wholly poor ventilation.

Pittsfield—F. J. TAYLOR, M. D.

Pneumonia, phthisis pulmonalis and typhoid fever are the most common diseases. There has been a greater number of cases of diphtheria during this last month (July) than for the last five years, some of which assumed a malignant type or what we termed putrid sore throat. Two of these cases died last month. The first case we had was fatal in four days. It was a sporadic case of malignant diphtheria; the stomach being so affected that nothing could be kept on it a moment. Measles have been very prevalent for two springs during the last four years, and in several cases assuming quite a serious nature, but none fatal.

In **Scarlet Fever** unsanitary conditions add to the severity of the disease and make the prognosis more unfavorable. One-half of my cases, at least, were from infection.

Diphtheria is not very prevalent. Impure air vitiating the blood and then taking cold is often a cause.

A little girl was taken violently sick with diptheria and died on the fourth day. The mother of this child was taken sick the day the child was buried, and was very sick, but recovered. Before she recovered two other members of the family were taken with the disease in a mild form, and about a week after all had recovered a little babe was taken with the same disease and died. They lived on the bank of the river in a low, sunken place, and people from the village have been allowed to clean out their cellars each spring and tip up rotten potatoes, turnips, etc., on the river bank, and I noticed at this time that the scent was very bad along the river, from rotten potatoes, etc. I should say this unsanitary condition had much to do with the sickness of this family.

I have noticed cases of **Typhoid Fever** from pollution of the drinking water, but have not seen recurrences in same families.

Phthisis is frequent. I think the causes are frequently heredity, exposure to sudden changes of temperature, sleeping in small, unventilated bed-rooms, and dampness due to lack of proper drainage of cellar. I think more are taken sick from poor ventilation than dampness, but both are important factors. I think that school-house air is a cause. As regards contagiousness, I remember one young man who was perfectly well until he took care of his brother, sick with phthisis, and after three weeks was taken sick with same disease and died before the brother he cared for. I can think of one more case like the above.

The School-Houses are not equally heated in cold weather, it being too hot near stove and very cold in back part of room. The floors are usually cold and hence the children have cold feet while their heads are hot. Have noted case after case where children and teachers have taken severe cold from the ill-contrived heating apparatus. Sometimes during the cold weather, 25 per cent. are absent on account of sickness. Headache is common. We should isolate carefully all cases of scarlet fever or diphtheria in the schools as well as other members of same family. A physician's certificate of safety should be required before the patient is allowed to return to the school.

Pittsfield—N. PUSHOR, M. D.

The village is situated in the south-east corner of the town and is not one of healthiest of towns, on account of the poor drinking water which is strained through clay, muck and quick sand, and the drainage is fearfully deficient; privies are wofully neglected. and hence we have a large amount of diarrhœa and dysentery, typhoid fever and diphtheria. The latter, according to my observation, has been caused by damp cellars and badly-ventilated houses. More ought to be said and written on faulty ventilation and want of sunlight and on decomposition of vegetable matter.

There is in this locality about the usual amount of pulmonary phthisis, with the usual causes; hereditary predisposition, lung fevers, exposure to the sudden changes of the weather and badly-ventilated sleeping rooms.

Portland—T. A. FOSTER, M. D.

So far as my experience goes unsanitary conditions have but little to do with the causation of scarlet fever. I think all my cases can be accounted for by endemic or epidemic influence, without taking contagion into account. I have known of many thoroughly exposed to escape it, and others most carefully excluded from it contract the disease. So frequently is this the case that I often doubt its contagious nature.

I have not observed that Diphtheria is spread by public funerals; but, as I believe them to be a great nuisance, I should like to see them forbidden.

I have noticed many cases of **Typhoid Fever** which were apparently caused by the pollution of water from various sources.

As causes of **Consumption** I would enumerate, particularly, heredity, bad air and bad food. The bad air and the confinement act in our school-houses as causes of consumption.

Bad ventilation and faulty lighting are the most frequent faults of our **School-Houses**, but these faults are not so common as formerly. Upon the whole I believe our teachers are as healthy as persons in other occupations. More healthy than shop girls as a rule. Still many of them are constitutionally nervous and get anxious and wakeful at times, and particularly during the last few weeks of our long terms.

Portland—CHARLES L. HOLT, M. D.

During the five years following March, 1865, I was in practice at Mechanic Falls, residing in Poland.

Three invasions of **Small-Pox** occurred; each in the spring and all derived from rags used in the paper mills. Two of the attacks appeared in successive seasons and were credited with having been derived from the same lot of stock, said to have been imported from Italy. Of the two epidemics above mentioned the second was much more severe, although, thanks to the very general and thorough vaccination, most of the cases were mild. One of the most severe occurred in a lady who had previously suffered from an attack of variola. My observation at that time led me to the conclusion that thorough vaccination is always equal to the occasion as prophylactic in this disease; and I have since seen no reason to change my opinion.

While at Mechanic Falls I was called to a family living on a cross road, with houses separated by one-fourth mile or more, and found a boy of about ten years suffering from premonitory symptoms of **Scarlet Fever**. As he was of sandy conplexion, I deemed it wise to defer my diagnosis until my next visit, the following day, when it was fully confirmed. A girl, younger than he, was now complaining of sore throat and general *malaise*, and at my next visit had the rash well out and the third and only remaining child was also sick. As the children had not been away from home for weeks and there had been no cases in the vicinity for a long time, I was about to adopt the opinion that the disease must have developed *per se* when a young lady in the house (half-sister of the sick children) incidentally remarked that the disease was quite prevalent in Portland. Inquiry elicited the statement that she had been at work in a tailor's shop in that city, and that one of the shop girls had attended the funeral of a friend dying of scarlet fever; and thus the poison had been conveyed to my little patients through a person not directly exposed. Several similar cases have come under my observation during the past twenty years, thus confirming the opinion of others that a single scale of the desquamating cuticle is sufficient to convey the disease to the susceptible, until devitalized, and that the length of time required for such devitalization is very uncertain.

Since my residence in Portland I think every case of **Typhoid Fever** under observation has been easily traceable to its cause; and in most, if not all, the cause has been emanations from water-closets and vaults. One particularly sad case where a very bright and capable young miss of thirteen, and an only child, succumbed to the disease after a distressing sickness of eleven weeks, was undoubtedly due to the poison inhaled through an untrapped water-pipe leading from the kitchen sink directly into the vault in the cellar beneath. This family had been repeatedly warned of the danger incurred, but could not be pursuaded to move until too late to save their child.

While practising in Gray a young man of twenty-two years called at my office Saturday evening with the request that I would send his brother of twenty some medicine, as they thought he had typhoid fever, giving as a reason for the diagnosis that a sister had just had the disease as diagnosed by a neighboring physician. The medicine was sent on condition that if not better the next day I should be notified and visit the patient. I was summoned the following Monday and found him seriously sick with well-developed typhoid of a week's duration; also the messenger of Saturday confined to the house with intense pain in the head, back and limbs; he was ordered into bed and died in about two weeks. Wednesday the mother was indisposed, and Friday, in bed and delirious. The first of the following week a daughter aged fifteen was attacked and died in about ten days. The disease steadily progressed through the family until father, mother and seven children had the fever; the entire family at home excepting one daughter of 16. The two fatal cases were sick in the parlor and sitting room, respectively. During the first week a careful examination was made of the house, woodshed, barn and surroundings and nothing found to specially condemn until the cellar was reached. This was damp and partially covered with boards and planks resting directly upon the earth. Along the side, beneath the sitting room and parlor, were built potato bins of rough boards, the floor being raised about six inches above the cellar bottom, loosely laid, with cracks and holes of sufficient size to allow the smaller potatoes to drop through. Having no doubt that I had found the cause of the sickness, the information was imparted to the father with the request that everything movable should be conveyed to a distance from the buildings and the cellar well cleansed; and he promised to attend to it immediately. Unfortunately no further attention was given the subject until a week from the next Sunday, when, finding the young man in a hopeless condition, and the parlor patient rapidly drifting into the same state, a second examination of the cellar disclosed everything *in statu quo*. It being a day of leisure, several of the neighbors were about, and to them was made a very emphatic statement of facts with the request that they would clean it out, which they did, removing with other rubbish nearly a bushel of rotten potatoes and accumulated filth. From the above, with many less marked cases it has been impressed upon my mind that any decaying vegetable matter, whether about the house or in condition to filter into the drinking water, may develop the disease; although, probably, imperfectly-constructed and ventilated water-closets and defective privy vaults are among the most common causes.

Portland—A. K. P. MESERVE, M. D.

In relation to **Scarlet Fever** I can give you some notable examples of contagion observed by myself.

A man unloaded a load of charcoal in Portland at a house where a small boy had an abscess back of his ear as a sequel to scarlet fever. He drove twenty miles upon a coal cart to his home in Hollis. About ten days from that time his two children had scarlet fever, no cases having previously existed within many miles.

A few years after an almost exactly similar occurrence was observed in the same town, except that the coal was left at a house where scarlet fever, not its sequelæ existed.

A child died in Westbrook with scarlet fever; the body was carried into a small chapel in Buxton where several of the neighbors attended the funeral services; the casket was not opened and no one took the disease there. The casket was set on a bier in the cemetery, on a hill, while the concluding burial services were performed. The wind was westerly and all the people present, except two of the bearers, stood upon the westerly side of the body. Ten days afterwards the children of each of the two men who stood on the easterly side of the casket had scarlet fever.

A little girl in a family of four children had scarlet fever; she remained in the same room with the others, two of whom took the disease; the fourth child slept with one of the secondary cases, but did not take the disease. About two months after the recovery of the children a little girl living in the neighborhood went into the house and looked at pictures in a book owned by the children, and about twelve days after had well-marked scarlet fever, which was, I think, the only case communicated by the family of four.

I do not believe the disease ever occurs except by contagion, although it has often been impossible to trace them; indeed, the histories of cases one and two were only obtained by most diligent inquiry.

In answer to the questions anent **Diphtheria** my own opinion, founded entirely upon my own observation, would differ materially from that of many physicians, to wit: I think it occurs sporadically; is propagated by infection or contact of particles: have never known it to be carried by clothing or spread by funerals. I have never known diphtheria to be spread through the schools, although I had from 1857 to 1880 a good opportunity for observation, being on the school board in a town of 2500 inhabitants most of the time.

Portland—C. D. SMITH, M. D.

The causes of **Diphtheria**, when it has prevailed here, have seemed to be, primarily, defective hygienic condition of dwellings; secondarily, continued neglect of preventive measures in the presence of the disease, and, in many cases, apparent disregard of the commonly accepted views of contagion.

During the past eighteen months I have seen a number of cases of diphtheria, varying from the mildest to the most malignant, and limited to no particular part of the city.

Ten of these cases were upon the summit or the slope of the eastern extremity of the city, known as Munjoy Hill.

The most malignant case was that of a little girl of four years, in a family of seven, occupying a house of six rooms, small and poorly ventilated. The water supply was Sebago; the receptacle for excrement, a wooden-box privy. Most of the sink drainage was upon the surface of the yard.

This child was taken sick Monday night, and died on Wednesday noon. A thick, firm membrane covered the root of the tongue, both tonsils, the pillars of the fauces on the left side, the soft palate, and the posterior wall of the pharynx; the right pillars and the right tonsil were the seat of a large slough. The nasal passages were blocked, and the eyes in a state of diphtheritic conjunctivitis.

This child had not been out of the house for weeks, and no children or adults had been allowed access to the house, on account of the serious illness of the father.

The other three children were isolated as well as possible, and the strictest antisepsis and disinfection insisted upon, and carried out under my own direction.

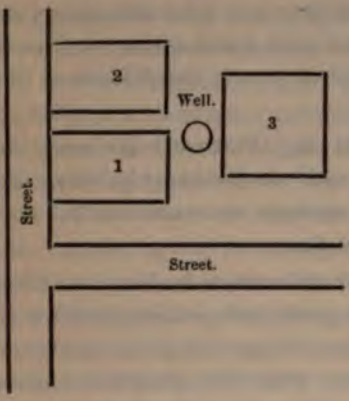
On the fourth day after the death, a girl of 10 years was taken sick, and for several days lay at the point of death. Three days after the beginning of the second case, a boy of 13 was attacked by a milder form of the disease; the other boy of 8 years escaped.

Another malignant case occurred in a family consisting of the parents and four children.

I was called about twenty minutes after the death of the youngest child, a boy of nearly three years, who had been sick four days. The dead child lay in the front room, a boy of 6 years was very sick in a back room, and a brother of 8 and a sister of 12 were up stairs, having so far escaped. The dead child was at once buried, the rooms thoroughly fumigated and cleansed, and the well children isolated. Three days later, the girl was sick; the boy of 8 was not attacked.

This dwelling was a story and a half corner house, with plenty of air and sunlight, and the family wanted for nothing in the way of home comforts, yet the cellar was low, with a dirt floor and not particularly well ventilated. Directly beneath the dining-room, was an open eight-inch drain pipe connecting with the main sewer. Next this was a water-closet, the only flushing of which was by the flow of waste water from the kitchen sink.

The drinking water was from a covered well, situated within a few feet of the adjoining dwellings.



Space between Dwellings 1 and 2,=2 feet;
Between 1 and 3,=10 feet;
All three houses supplied from this well.

Correction of these apparent evils was urged and their importance as a possible and extremely probable source of the disease pointed out, without making much impression upon the mind of the head of the family, who, while more than anxious to do every thing to avert further danger, could not be convinced that a disease so deadly could be caused by no more glaring defects than I had been able to point out about his dwelling.

These cases occurred early in August, 1885, and no change was made in any of the surroundings until the father himself was attacked by a most malignant form of diphtheria September 5th, when several holes were bored through the cover of the well for ventilation.

Whether the well had any influence as a causative agent I can not with any certainty affirm, but the soil of Munjoy Hill is a loose gravel piled upon a subsoil of rock and clay, the most favorable conditions, therefore, exist for the percolation in all directions of all sorts of filth, wherever existing.

It is, however, certain that all efforts to secure the introduction of Sebago water and its use, instead of the water from this well, have thus far proved unavailing.

While in many cases adequate cause seemed to exist, either in contagion, direct or indirect, or in defects of drainage ventilation or water supply, I am forced to admit that in an equal number of cases no reason for the existence of so fatal a form of the disease as I have seen here has been apparent.

From my own observation I have not known diphtheria to be spread by public funerals, but, from the testimony of responsible persons, I am satisfied that such have been held without any restrictions, contrary to the advice and even remonstrance of friends and others, and that cases have occurred among the children of families attending these funerals.

On the northerly slope of this city (Portland) are many houses built years ago, and furnished with old-fashioned privies. Few of these dwellings have modern sanitary conveniences, but are well supplied with privies and cess-pools.

A family residing on one of the side streets leading from Congress Street to Back Cove, by a steep grade, had, in their yard, a well and a privy within a rod of each other, though the privy was below the well. Their neighbors, however, with few exceptions maintained the same privileges, and they, living near the foot of the street, received in their wells, it is fair to presume, contributions from the yards of their neighbors above. In less than three years, two members of this family died from **Typhoid Fever**, and a third with a train of symptoms which so resembled typhoid as to excite a strong suspicion of its presence.

During the month of September, 1885, a woman who lived in a tenement house on Washington Street occupied by several families, died of typhoid fever of a peculiarly severe type. Instead of disposing of the dejections as directed by the physician in attendance, her friends were careful to throw them without any disinfection into a privy vault used by the tenants in the same house and two adjoining dwellings. Within six weeks three or four cases of typhoid occurred in these same families. I am informed by the tenants that this woman had lived there but a week or two when taken sick, and, as the water supply of this house is Sebago, there is reason to attribute the outbreak to the careless exposure of filth from this patient. No sickness had occurred in this building before, of this nature.

Cases of **Phthisis** are quite frequent, and the more potent causes seem to be damp, ill-ventilated dwellings, insufficient food and that of poor quality, exposure and intemperance.

Out of twenty-seven cases of phthisis treated during the past two years in hospital and private practice, a large proportion were from the lowest classes of our foreign population, and in all but three cases the disease was acquired, and not one gave any history pointing to hereditary influence.

Much alarm has been felt by parents in the eastern part of this city by reason of statements and rumors affecting the sanitary condition of a certain **School Building.** The school sessions were suspended and a thorough examination of all drains, traps, water-closets, urinals and ventilating pipes made by competent workmen, who state that they found nothing to account for the outbreak of disease. The drains were properly graded and the traps tight.

Now, considering the fact that the cases occurring among the children of this school were but a small per cent. of all cases which have arisen in the city during the past year; that from January 1st, 1885, to December 1st, 1885, out of twenty-nine fatal cases in the whole city, only ten were in this school district, and of these ten only four were of school age, it seems only just that in the absence of any discovered defect in the school-house, which could have been of the slightest effect, or could have even suggested the source of disease to unprejudiced minds, before concluding positively that the cause had been located, thereby distracting attention from other possible sources of trouble, strict inquiry should be made as to what measures of isolation, quarantine, disinfection, and prevention of public funerals have characterized the management of all cases among the inhabitants of this school district, and what may be the sanitary condition of their own dwellings and their surroundings. An opinion based upon an accurate knowledge of these facts would be of some value in determining how far the school building might be held responsible.

Portland—G. B. Swasey, M. D.

I have seen four cases of **Diphtheria,** all severe. Three were apparently caused by direct transmission. The cause in the fourth was unknown. One fatal case in an infant.

Portland—S. P. Warren, M. D.

There have been several cases of **Diphtheria** under my care during this year, though restricted to no particular locality in the city. The majority have been among the foreign population on

Centre and Pleasant streets where accumulative privies have an unusual prominence. One house contained six cases with two deaths; membraneous laryngitis and exhaustion from the intensity of the suppuration and sepsis. This house was complained of to our City Health Board who ordered it cleansed. Its privy was full of a festering putridity, the sewer wash-traps were useless and the house was constantly full of sewer and privy gas. A second case was in a house adjacent; membraneous laryngitis of probable diphtheritic origin. There had been other cases in this house previously of pharyngeal diphtheria. In both these families nearly all the children were sooner or later attacked. As to its causes there is a notable association with putrid privies and the disease.

Typhoid Fever is comparatively a rare disease in Portland and its etiology usually obscure. Two or three years ago I attended a boy fourteen years of age who had been eating freely of lobsters, stolen from the cannery at the dock. Two other of the children and the mother were successively attacked, but each in a milder and shorter form, but with unquestionable typhoid symptoms. Within ten feet of the house were four putrid privies which "smelled aloud and cried to Heaven."

I am much impressed with the necessity, for a city like ours, of a system of compulsory quarantine for the subjects of infectious and contagious diseases. For instance: last week the most malignant case of diphtheria I have seen in ten years was not buried for three days, though faint attempts with sulphur were made at purification during that time.

Princeton—C. FLOWER, M. D.

Consumption and rheumatism are prevalent. Rheumatism is the more so, and a peculiarity of our diseases is that they are very largely caused by, and complicated with, rheumatism. No case of scarlet fever has come within my knowledge in the last three years. There have been a few mild cases of diphtheria, but no deaths. Typhoid fever prevailed in a mild form with a few pretty severe cases in the summer of 1882–83; none in 1884; one imported case in 1885. So there can scarcely be said to have been an epidemic of these diseases in the last three years. The township of Princeton has a population of about 1,000. The following is the percentage of deaths from the several diseases in the last three years ending July 31st:

DEATHS FROM JULY, 1882, to July, 1885.

From	Consumption	6	deaths or	27.27	per cent
"	Pneumonia	3	"	13.6	"
"	Tuber. Meningitis	2	" (babes)	9.09	"
"	Cardiac Dropsy	1	death or	4.5	"
"	Bronch. Phthisis	1	"	4.5	"
"	Acute Laryngitis	1	"	4.5	"
"	Hepatitis	1	"	4.5	"
"	Enteritis	1	"	4.5	"
"	Cerebro-spinal-meningitis,	1	"	4.5	"
"	Flooding (Antepartum)	2	deaths or	9.09	"
"	Cancer of rectum	1	death or	4.5	"
"	Typhoid fever	1	"	4.5	"
"	Old age	1	"	4.5	"

Total, 22 deaths in 3 years, or 7.33 per thousand annually. Cerebro-spinal-meningitis prevails every year, mostly in spring and fall. The cases are generally mild, but some are severe. Small-pox has never been in this town.

I have known several children to take **Scarlet Fever** from persons who had been attending on patients sick with the disease. I do not think that unsanitary conditions cause scarlet fever, but its severity may be increased by unhealthy surroundings. Probably all cases are due to infection. I never could find any other cause, as infectious conditions were always present. I have seen many cases of scarlet fever in which, after being exposed to the infection, it was supposed they had escaped because they had not been sick; but on inquiry I found they had had some headache for half a day and slight ill-feeling which had all passed away by the next morning. The following week, however, you could plainly observe desquamation, especially by rubbing the damp hand over the skin. Desquamation is the true test of the disease having been present. I think there are very few who escape having it when exposed to the infection. Those who say they never had it, although they can go where it is without taking it, are cases who had it so mildly in early life that it escaped detection. I base this opinion on numerous cases I have observed.

There have been a few mild cases of **Diphtheria** in this town in the last three years. I know of no other cause but infection. I have scarcely seen a case for twenty-five years that I could not trace to its infectious origin in some person, and for the last ten years I have satisfactorily traced almost every case. In 1881, there had been no diphtheria in my neighborhood for nearly four years. The school teacher, during the summer vacation, went to the city, a notorious hot-bed of diphtheria. While there he contracted what he called a slight sore throat. He returned with this still upon him and opened school. In less than a week there were six lying sick with diphtheria and the school was closed. As the children spread the disease in their several families, it resulted in five deaths, three of which were adults. I have known two or three outbreaks very similar to this in their origin, and even more fatal in their results.

I have known **Typhoid Fever** to originate in a camp of men who slept on damp, mouldy straw with other filthy surroundings. It was very contagious. When they went home with the disease, their whole families took it. There were no deaths. I have not observed it to recur on successive seasons in the same house. I have known an individual to take it by sleeping in a bed-room three months after it had been occupied by a typhoid fever patient. I think this was caused by not thoroughly cleaning and disinfecting the room.

Consumption forms the leading disease in this part of the State. The predisposing cause is hereditary influence. The exciting causes are very commonly influenza, child-bearing and suckling children. Dampness and bad ventilation may have a share in producing it, but how far they are conducive to it I cannot say. Anything that interferes with the process of general nutrition seems to be an exciting cause. I do not think that bad ventilation of school-houses has much to do with producing consumption. In almost every case of phthisis there are statements that fathers, mothers, uncles, aunts, or some relatives, have died with it. The McL. family, with whom I am acquainted, had it from their great-grandfather's family in Scotland and it has followed every branch of the family in this country. Otherwise they are a strong, hardy family, and generally remain healthy till twenty-two to thirty years. Many of them then sicken and die of consumption. I have long observed that the husband often seems to take it from the wife and *vice versa;* and especially when they sleep together during sickness. This, however, is not so in every case.

The most common faults in our **School-Houses** are imperfect distribution of heat—some parts of the school-room being too hot, while other parts are too cold. Near the floor it is always too cold, while the higher parts of the room are too hot. My own children have had their health impaired by being shut up in an over-heated, ill-ventilated school-room. Although it is not easy to distinctly trace cases of sickness in children to defective ventilation and over-heating of school-rooms, yet I am certain there is much ill health from this cause among children. Headache is quite frequent among the elder pupils.

Prospect Harbor—C. C. Larrabee, M. D.

Diphtheria was at Bar Harbor ("across the bay"). One boy came into this town after having the disease there; as a result, in about eight days two boys with whom he went to school were attacked with the disease, as well as a few scholars and the teacher; no fatal cases. The disease was confined to the school, and with care but about 20 per cent. of scholars had the disease.

Pulmonary Phthisis is and has been very common in one locality; very frequently, I am of the opinion, it is caused by dampness, the situation being such that there is high land on each side of the valley; the fog makes in from the sea a great part of the year. Have seen some cases that appeared to be caused by infection.

Readfield—W. A. Wright, M. D.

Rheumatism, catarrhal fevers and erysipelas recur pretty often. We have had scarlet fever in our town as an epidemic five times during the last twenty years. Twice very severe and quite fatal, viz., in 1864 and 1870, the last time very sudden and severe, patients sick but a very few days and unconscious almost as soon as attacked. We have had three epidemics of diphtheria; first in the fall of 1862, when it was widespread in the eastern portion of the town; then in 1863–4, when the northern and western portion suffered; and again in 1875–6, when the middle portion suffered. The first time not very fatal, but many had the disease. The second and third times very fatal, of the croupal form, and many cases with abscess of Parotid and other glands. Typhoid fever has come in twice during the twenty years. First in 1863, when it was widespread and severe, but not fatal in any case. Again the next year (1864), not many cases, but very fatal. Other years we had more or less of the three diseases till four years ago, since which time we have had but few cases of any of them.

Small-Pox we have also had three times. First in 1864, brought from Whitefield, Maine, by a student at Kent's Hill, resulting in two cases of small-pox and five or six of varioloid, none fatal; in 1868, brought from Dedham, Mass., two cases small-pox, both fatal, and seven or eight cases of varioloid, all of which recovered. Third time in 1875, brought from New York, and two cases of varioloid. No cost to the town except for vaccination.

I know of one sporadic case of **Scarlet Fever** in a girl thirteen years old who had the disease very severely, so that the skin came from her hands and feet with the nails attached like gloves and socks; recovered. No other cases around that year.

In two epidemics of **Diphtheria** I have regarded the cause as being drouths with summer rains following, as the disease commenced then and was widespread, and apparently not communicated one from the other. If one cause has contributed more than another to spread diphtheria, it has been kissing those who were suffering with the disease.

I knew of four or five cases of **Typhoid Fever** which I supposed to have resulted from drinking water from a well that had not been uncovered or used for two or three years. All proved fatal. The well was some four rods from the house but in good location.

I have known quite a number of persons who were formerly well and without hereditary tendency to **Consumption** to die of the disease soon after caring for a consumptive wife or husband.

Richmond—A. LIBBY, M. D.

Several years ago I was called to visit a family living about four miles from this village, in which were four children, two of whom were sick with **Scarlatina**. Both recovered—the other two escaped the disease, though no precautions were taken to prevent their having it. This was in the spring of the year. Late the next fall I was called again to this family and found the two children who escaped in the spring down with the same fever. At that time there was not a case of scarlet fever in town except these two. On inquiry, I found the bedding which had been used for the sick children in the spring, but which had been, as was thought at the time, carefully cleansed and aired, had been put on the beds of the children now sick. It is my opinion this bedding was the source, and the only source, from which these children contracted the disease. One of them died, but the second ultimately recovered.

Last fall, a family living about two miles from our village sent for me to see their little girl, nine years old, who was quite sick. I found she had scarlatina, but was puzzled to know where she could have contracted it, there having been none of the disease in the village or thereabouts for more than a year. The parents declared the child had been nowhere to get it and no one had visited them who had been sick. The little girl recovered after a severe illness, but before that time three other children were taken with the fever, one of whom was very sick indeed, and only recovered after a long and dangerous illness. After the convalescence of his children, their father showed me a pillow which he purchased a short time before the girl was taken sick. He bought it for a feather pillow, but it was found to be filled with flannel rags cut in small pieces. This pillow the little girl used, and I think the rags must have been infected with scarlatina, and from them the child contracted the disease.

The first case of Diphtheria I ever saw was in 1860, in the family of John Temple of Bowdoinham, about six miles from this place. Mr. Temple had eight children and four of them died in a few days. In the years 1860–61–62, diphtheria prevailed as an epidemic in this village and its vicinity and was very fatal. It did not seem to spread from contagion, as it would occur in parts of the town widely separated and where it did not seem possible there had been any communication whatever with those who were sick with it or who had been sick. During the epidemic I was called to attend it in every form, from the mildest to the most malignant, but I did not contract it nor carry it to my family or patients. In the fall of 1861 I was connected with the 4th Regiment of Maine Volunteers while they were encamped about two miles from Alexandria. The diphtheria broke out in the regiment and I think there were fifteen or twenty cases, and several deaths occurred. I was obliged to put those sick with this disease into the field hospital, by the side of men who were sick with different diseases, or who were convalescing, and there was not a single instance where this disease was communicated to those other patients in the hospital. I do not think diphtheria contagious like measles and scarlatina. At that time measles broke out and all in the regiment who had never had them took them now. But not so with diphtheria. It is evidently infectious and any one who is brought in contact with it is more likely to have it than if he had not been so exposed. At the time it prevailed in the

4th regiment in Virginia there were several farm-houses near our camp whose families were attacked with diphtheria. In one house five children had it, and two died with it. I was told by these people they never saw a case before. This house was outside our camp-lines and these children had never been near our people. I do not think the disease has been spread in this town by public funerals.

Near the last of June, 1854, the **Cholera** broke out in this village and forty persons died with it in about six weeks. It was very fatal, not more than one in ten recovering who was attacked with it. One small house contained two Irish families. There were the father and mother and five children in one of these families, all of whom died within nine days, but one child. Three members of the second family died also within those nine days. Another family of six all died. The father was the last one to succumb to the disease. He was very tired and much worn with watching when his last child died, but he walked out on the street at 9 o'clock in the morning, was taken sick at 10 A. M., at 2 P. M. he died, and was buried at 4 P. M. that same day. I mention this circumstance to show how rapid was the work of the disease and how fatal. The disease first showed itself by diarrhœa, followed by vomiting, then severe cramps in the legs, then collapse and death. The discharges were like rice water and had very little smell. Those attacked usually died within twenty-four hours. That the cholera is infectious I have no doubt, but think it not contagious. Here let me mention a case where I thought it was communicated by infection. A Mr. Toothaker was called in to assist in nursing a cholera patient who died in about eight hours. I think Mr. T. stayed and assisted in laying him out. In four days Mr. Toothaker complained of feeling unwell; he was immediately taken down with cholera and died in nine hours. I noticed in attending these cases of cholera, the effect upon me was very depressing and my bowels were constantly out of order; a little diarrhœa usually. The most of the deaths were among the Irish, some of whom had lately arrived in our place; but some of our best citizens in the best localities died at this time with cholera. The first cases occurred after eating baked pigs (young pigs baked whole), and left over a night after a celebration for which they had been prepared. I state this fact, but cannot say as this was the origin of cholera in our place. Our town was in its usual sanitary condition; there was a great deal of building at that time and some attributed the disease to having so much of the earth disturbed around the streets. The sickness prevailed for six weeks, then subsided as suddenly as it came. We have had nothing of the kind since. There was a complete panic among the people, all work was abandoned and the inhabitants left town by hundreds.

Rockland—T. L. Estabrook, m. d.

Rheumatism and bronchial affections are quite frequent. We have very little of scarlet fever, diphtheria or typhoid fever, and that of a very mild type. Very rarely they prevail epidemically. In a period of twenty-five years, since I have practised here, I think small-pox has invaded our city not more than three or four times. As this is a seaport town it has generally been brought here from abroad. Each time the cost has been from $500 to $2000. Consumption, I think, is not very prevalent. I am quite sure, from my own observation, that infectiousness is a common cause of phthisis.

I am quite sure that owing to the great quantity of lime that is manufactured in this city, which is the industry of the place, and which requires an immense amount of wood in its manufacture, has a sanitary tendency upon the inhabitants. I feel quite certain, from a long practice, that Rockland is far healthier than any of the contiguous towns, more particularly in regard to contagious diseases. It is seldom that we have a case of typhoid fever, and very rarely a fatal case. What influence the burning of lime has in such cases I am unable to state, but such are the facts. We have a good supply of pure water at all times, which may have some influence in this matter, and drainage is very good in most parts of the place.

Rockland—F. E. Hitchcock, m. d.

The drainage is, principally, into three brooks, which radiate to the northern, western and southern sections; they unite near the centre of the town, about twenty-five rods from tide water, and the common channel empties into a bay or cove of the sea at high-water mark. But there is a main sewer, of large size, through the main street, with sufficient inclination, about fifty rods. The brook is uncovered, and formerly in a filthy condition; has been cleaned out this year. At times the odor from the brook was very objectionable. It has been suggested by city physicians that the brook should be covered. Pneumonia and rheumatic fevers are quite prevalent. There has been a slight epidemic of scarlet fever this year, mild in form. Diphtheria is generally sporadic only; none so far this year (fall) that I know of. Typhoid fever practically absent; accounted for by reason of water supply; few imported cases. Small-pox has been here but once in the fourteen years that I have a knowledge of the town. The origin then was by an express messenger. It was expensive.

Diphtheria has usually been caused by bad sanitary conditions. I had a sporadic case of diphtheria in a boy twelve years of age whose family had lately moved into a house on a street where all the other houses were supplied with water from the city water system; but this house was dependent upon a well and moreover the drainage of this house was bad, so much so that some years before, when City Physician, I had cited this house in my report to the City Council as an example of the evils of bad drainage and well water combined. Immediately after the family moved into this house the boy was attacked. In five days after the inception of the disease, and when the boy was literally moribund, I did a tracheotomy. Casts of false membrane, perfect in form, were pulled from the trachea; stimulants and artificial respiration applied, and after seventeen days the tracheotomy tube was removed and the boy recovered. From this case other members of the family were infected and the father died. The grandfather came from a distance of sixty miles to the funeral and had the disease, as also did his wife and two grandchildren, of whom both children died. My records show no other cases at the time of this primary case and I believe that there had been no cases near the grandfather's home.

I have seen cases of **Typhoid Fever** originating from unsanitary conditions, and I had two sets of cases of typhoid fever situated in different parts of the city and unconnected with each other, caused by washing clothes for Bar Harbor people.

In our **Schools** the privy arrangements are bad and there is a lack of proper ventilation. The teacher often suffers with headache and sometimes the scholars, too, at the house on North Main street, the ceiling being very low and ventilation imperfect. One of our citizens thinks his son was badly affected by gas in the high school building.

Rumford—F. E. SMALL, M. D.

All my cases of **Scarlet Fever**, about twenty, have been traced to contagion from other patients. Isolation, as far and as quick as possible, has prevented an epidemic, I think. I always insist on thorough cleansing and burning of useless articles after cases of scarlet fever, so I have not seen the poison preserved in such fomites.

All my cases of **Diphtheria**, except one, have been in houses damp and unventilated, and where the people had poor food and were more or less uncleanly in their habits.

I have seen only three cases of **Typhoid Fever** in six years. The town is noted for its freedom from typhoid fever. One case in a child was very mild; one was seen but once, as it was under the care of another physician; one was a severe case contracted in Auburn. The water supply is largely from aqueducts with lead and iron pipes. All start from springs some distance from buildings.

Consumption is quite common. My opinion is that more than 50 per cent. of the cases of phthisis is caused by imperfect ventilation and dampness.

In our **School-Houses** we find poor ventilation, bad heating and insufficient light. All are afflicted more or less with colds, headaches, and some with defective vision, especially in the winter season.

Saccarappa—C. W. Bailey, M. D.

Throat and lung diseases are more prevalent than others. Intractability of these diseases is a peculiarity. We have had three epidemics of scarlet fever within seven years. In 1878–79 it prevailed to a serious extent, many deaths occurring. Its contagious nature was then well demonstrated. Diphtheria is almost sure to appear each fall, continuing to appear sporadically through the winter, and in the spring becomes epidemic again. I have a case of the disease at this time. Typhoid fever is almost unknown in our section; occasionally a case appears on the more elevated flats. Within the last ten years, **Small-Pox** has visited us three times, always by infected rags at the paper mills of this town. Five years ago, two of the help at the mill became affected with the disease at the same time—one unprotected, the other vaccinated several years before. The confluent case came under my care. Two others had the disease, myself one of them. I was successfully vaccinated forty-two years before, and not afterwards. The disease affected me so little that, if it had not been for endangering the public, I might have been about my business all the time.

Two months after, a mild case of **Scarlet Fever**, and after the house had been well cleansed, re-papered and painted, the house was occupied by a new tenant. Soon afterward a child of the family had scarlet fever which could not be traced to any other source than the house.

Damp, cold weather, with unsanitary conditions of the section infected, has seemed to me to have much to do with the causation of **Diphtheria.** A family of five children visited Connecticut, where the disease prevailed. In a few days after their return, two of the children were taken with the disease in its most malignant form. There were no other cases of diphtheria in town.

Nearly twenty-five per cent of the deaths in this immediate vicinity result from **Phthisis.** Its causes are largely climatic.

Saco—L. D. DENNETT, M. D.

Consumption, pneumonia and typhoid fever hold quite a prominent place amongst the prevailing diseases. There has been no epidemic of scarlet fever here for quite a number of years. No cases of diphtheria have been reported since I came here four years ago. Had an epidemic of typhoid fever in 1881. There may have been thirty cases. Small-pox was here once twenty years ago.

Bad ventilation in the **School-Buildings** is the fault most spoken of by the teachers.

Saco—F. E. MAXCY, M. D.

The prevailing diseases are, in winter, catarrhal inflammation and pneumonia; in spring the same; in the summer months enteritis, with the greatest mortality among the children; in the fall typhoid fever and the mild eruptive fevers among the children. There are a large per cent. of deaths from pulmonary phthisis at this season, also. The diseases in our city are as a rule very mild. I have not known of any cases of scarlet fever in the city in the past five years, and have seen only three cases of diphtheria in that time.

The greater number of cases of **Typhoid Fever** are met with in the months of September, October and November. This season the disease has been very mild; not a single death. Such was the case one year ago. During the fall of 1883 it presented a very malignant type, breaking out at points distant from each other and entirely disconnected. Beyond a doubt the Saco river has been a source of infection, very many of the operatives taking the disease from that source.

A very malignant type of **Diphtheria** broke out in Biddeford last winter among children in a small primary school. It spread rapidly and was only subdued by closing the school. As an illustration: A, nine years old, was stricken and died in three days; B, ten years, who occupied a seat with A, was taken within twenty-four hours, and died in two days, although living half a mile from A. No one in the neighborhood of B had the disease, contact with A must have been the source of contagion. There were several similar cases.

I have treated several cases of **Typhoid Fever** which, beyond a doubt, could be traced to bad drainage. In one instance the disease recurred twice, three years apart, in the same house, occupied by different tenants. The drain was within ten feet of the sleeping-room and on the surface.

Cases of **Phthisis** are very frequent.

Sidney—A. E. BESSEY, M. D.

A son of Mr. R. of Belgrade contracted **Scarlet Fever** during an epidemic, and died. The grandmother used a favorite old family shawl daily about the sick child. After the child's death, the shawl was folded up and put in the bureau drawer. Three months later, Mr. R.'s sister, with her child three or four years old, came on a visit. The grandmother got out the old shawl at once to use around this child. In two weeks the child came down with scarlet fever, without any other known exposure than the shawl. Yet, three other children of Mr. R.'s, in the same house, did not contract the disease during the sickness of either patient, though neither isolation nor disinfection was used. Mr. R.'s sister, living in Sidney, visited his family daily, during the sickness of the child that died, going home to her own children at night. In two weeks from her first visit, her little girl was attacked with scarlet fever, and died. Her three other children escaped the disease. This lady, on the death of her daughter, worn down with watching and grief, visited another sister in Massachusetts. In two weeks after her arrival, one of the sister's children came down with scarlet fever. There were no other cases in the vicinity.

Mrs. P. of Sidney received a letter from a friend, written in a room containing scarlet fever patients. Mrs. P. opened and read the letter with her only child three years old in her lap. In a short time this daughter came down with scarlet fever. No other known exposure and no other cases in town.

I am personally acquainted with the above-named parties and know that the statements are true. The old shawl and the letter say that scarlet fever is very readily communicated, but the R. children and their cousins who escaped say, "Doubt it!" However, I think we should *heed* the *evidence* of the *shawl*, the *letter* and the *clothing* of the visiting sister of Mr. R.'s. I have seen three well-marked second attacks of scarlet fever and have myself had *three* clearly-defined attacks, at the ages of eleven, twenty-six and thirty-three years. At present there are six cases in Sidney, embracing four families. In fifteen past years there have been but two fatal cases in this town, though the disease has frequently visited us. This is due in part, I think, to general healthy conditions.

G. Y., aged fifteen, had severe **Diphtheria** ten miles from home, at his grandparents'. No other cases in the community.

Three weeks from onset of attack I consented to his removal home, provided all articles of clothing and bedding were thoroughly fumigated with sulphur before they left the house. The mother claims to have complied fully. Within six days after the patient reached home, three out of five brothers and sisters were attacked with diphtheria and died.

E. M., aged fourteen, was severely attacked and died on the seventh day. On the fifth and sixth days after the onset of the disease the mother and three sisters were attacked, and one sister died. A nurse who cared for the little girl on the night of her death was attacked with diphtheria five days later. Other similar cases could be cited. Have never in this vicinity been able to trace the disease, reasonably, to unhealthy conditions.

Our **School-Houses** are poorly ventilated. Often without underpinning, with thin floors, and seldom with any temporary banking for winter, the winds sweeping under them, thereby exposing the scholars to almost constant cold feet. The rooms, furthermore, are very unevenly warmed; the stoves very near a part of the seats, over-heating the occupants, especially their heads, while other scholars remote from the stoves suffer with cold. In several houses the seats look as though designed to produce slow torture and deformity. To get the center of the "deestrict" or to get cheap land, several houses are placed near mosquito bogs, frog ponds, or other places of discomfort or pestilence.

Skowhegan—W. A. WILBUR, M. D.

The most frequently-occurring diseases are those of the internal organs, especially heart, lungs and liver. Scarlet fever seldom rages to such an extent as to necessitate the closure of public schools for even a week or two. **Diphtheria** visited us as a severe epidemic when it prevailed throughout New England to so alarming an extent, since which it has not been epidemic, but sporadic cases have been frequent. It has never been so fatal here as in other parts of the country, thoroughly-marked cases of typhoid fever very rarely, if ever, occurring of late. Tubercular phthisis is quite common, and diseases of the heart have been found very frequently since the war of the rebellion. Scrofula and cancer are quite common, the result more of eating *diseased meats,* especially canned, than of all other causes combined. If our eminent M. D's, L. L. D's, F. R. S's, &c., would cease harping on poison cans and turn their attention to their contents, their influence might secure a remedy against slaughtering and canning animals actually dying of disease. A government inspector should inspect every four-footed animal before killed. I should say that **Small-Pox** has been here five to ten times; cost to the town, from nothing to $500 each time.

Diphtheria is quite prevalent. The cause seems to be atmospheric influence (don't know what) operating upon a susceptible system (don't know the nature of the susceptibility). Have ridden three miles in a sharp frosty winter night (without the least inconvenience) to see a case of diphtheria, but on entering the sick-room my throat felt as I should suppose it would after inhaling black pepper. It is difficult to say when one is the victim of contagion, or of the same surrounding influences as the patient was, who is supposed to communicate it. A very great number of my cases have been among our well-to-do population and certainly not noted for uncleanliness. Often one child in a family will have it, all the others escaping; sometimes all the children will have it, the parents escaping; in other instances, a parent will have it, the children all escaping. In such cases I believe they are all subjected to the same atmospheric influence, but do not all offer the inducement of a suitable soil.

The last epidemic of **Typhoid Fever** through which I passed was some fifteen years ago and have seen but very few sporadic cases since.

In our **School-Houses** the greatest trouble comes from overheating and then opening the windows and causing draughts.

Solon—S. P. Greene, M. D.

The various acute diseases of the air passages, lungs and pleura are quite common here. There has never been an epidemic in this town of either of the three diseases mentioned since I have been here.

There occurred in the village of Athens, in the practice of Dr. Marr, a sporadic case of **Diphtheria**, which I saw with the doctor. The case ran a moderately severe course to recovery, when the nurse was discharged. Upon being discharged by the family in which diphtheria was, she was immediately employed to do general housework, if I remember correctly, by a family in Cornville. The family in Athens and the family in Cornville were some four miles apart. In the course of a few days diphtheria broke out among the children of the family in Cornville to which the nurse went, and one of the children, at least, died. No cases of this disease occurred in either locality outside the two families mentioned. On the other hand I have seen diphtheria in families of children when only one in a family would have the disease, and the circumstances of the family would be such that sick and well would be obliged to inhabit the same room a greater or less portion of the time every day.

It is said that a case of **Typhoid Fever** never originated in this village; one never has since I have been in town.

Phthisis is quite prevalent. Imperfect ventilation and sudden and extreme changes of temperature appear to be, to a large extent, the causes.

In our **Schools** there are imperfect ventilation and cold floors.

South Berwick—C. P. Gerrish, M. D.

Prevailing diseases are diphtheria, erysipelas, gastric and liver troubles, with typhoid fever near the ponds and Great Works River. Small-pox has invaded the town three times in the last twenty years.

At Springvale, in this county, lived a man who lost a child of malignant **Scarlatina.** In a few days the second child was attacked. At this stage he wrote a letter to his brother here in this village; the letter was taken to the brother here by a son eighteen years old; the brother opened the letter and read it (in December) and then passed it to his wife, who read it and was about to put it into a coal stove, when a child three years old wanted to read (?) it, as children try to do. The child had the letter around for half an hour, when the mother did burn it. In five days the child was attacked with scarlatina, and in six days an older child (five years) was attacked—the last one more severely than the first. By isolation and the free use of disinfectants, there were no cases arising from these. A family of four children had scarlatina. Every precaution was made to kill the contagion. Six months after, a cousin came to visit this family and the children were allowed to play in a finished attic and there they found some garment that proved to be one missed that was taken from one child when first attacked, and six days after the little visiting cousin had scarlatina. Very few cases have been sporadic; most all could be traced to specific contagion.

I practised in the town of York, in this county, from 1857 to 1867 and during that time saw some **Diphtheria.** Since the last date have been here, where I have seen in all (both towns) over 200 cases. While at York I saw very many at Kittery, an adjoining town. I think vegetable decomposition was largely the cause. In Kittery, from the eastern corner along the coast to the Piscataqua River (New Hampshire line), the land is very rough, small ledgy hills and intervening frog-ponds and marshes; in fact one can hardly ride a *gun-shot* along the road where he could not find a mud puddle, smaller or larger. The road is thickly settled by men who go fishing, coasting, or find employment at home or on the navy yard; and in one school district within three years they lost seventy-five children of diphtheria. A dry spring caused a large growth of weeds and grapes round the edge of these bog holes and frog-ponds, and a wet autumn produced great amount of new material for decomposition: and the odor of these places could be smelled after the first of August, and by October the disease was raging.

A man living at York, twelve miles from this place, was a fisherman. He had seven children, oldest twelve years. He owned about one and a half acres of land, and his house was built near the centre, on a little knoll. The land was clay and flat, rather low for a house. All the early spring and summer he took the offal from dressing the fish at the river with mussles and flats from the river bank, and formed a compost with soil for manure within four rods of his house. After mowing, he spread this filth over the top of his lot, nearly covering the top of the grass land with the fish dressing taken from the river, and by the middle of September I was called to see the first case of diphtheria in that town (York, where I then lived), and within fourteen days five of his children died.

One other case in a neighbor's family was fatal and these were the only cases in the vicinity. I have never seen the disease spreading in schools or by funerals.

In a farm-house situated on a high ridge, a son was attacked with low **Typhoid Fever** and died on the fourteenth day from intestinal hemorrhage. About this time four others of the family were taken, and at this stage investigation revealed a quantity of rotten beets, turnips, cabbage, etc., from an unventilated cellar. Two died; six others who had the disease were saved.

Phthisis is not very prevalent.

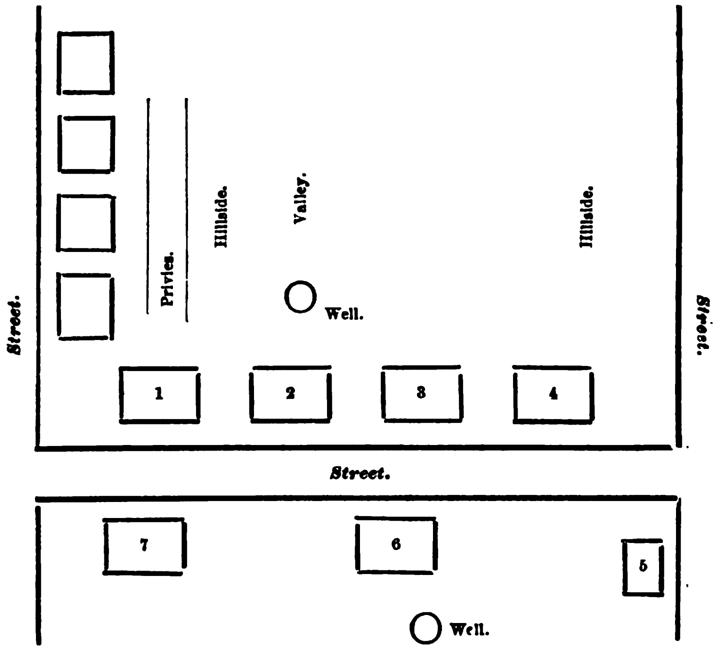
The **School-Houses**, except a very few, are dilapidated and open enough for good ventilation.

South Berwick—C. M. SLEEPER, M. D.

If you will allow me, I will place phthisis first among the prevalent diseases. I do not claim that it prevails as an epidemic, but I am convinced that it is mildly contagious, and perhaps, doubly dangerous on that account. Strictly speaking, we have not had an epidemic since I have been in town. I have had ten cases of typhoid fever in three years, nearly all of a mild nature. Two years ago we had some scarlet fever; there were no deaths and it did not spread beyond the limits of one school district. It has seemed to me that at times pneumonia has prevailed as an epidemic, but as yet I have not sufficient data to give an opinion. Small-pox has appeared twice, many years ago, and at the close of the war. It was brought by a soldier from New Hampshire the second time.

I am quite sure that I took **Scarlet Fever** at a funeral myself. I have had but five cases of scarlet fever, all occurring in the same family. The case was undobtedly from infection received at school. They were all sick at the same time.

My experience all goes to show that **Typhoid Fever** is caused by polluted water, and in every case I have been able to trace it back to some privy. The fall of 1863 was noted for dryness in our region. Early in November we had a great rain storm. Soon after, we had typhoid fever in a certain section of the village. All these patients used water from two wells which must have had the same source of supply. I directed the use of the wells to be discontinued, and there were no more new cases. Now these wells received, during the rain, all the surface wash from the high ground above. Filthy material had been accumulating for weeks, and the first rain that came washed it down. I am no artist, but here is a sketch.



Now in the houses No. 1, 2, 3 and 5 there were typhoid patients. In No. 2, out of a family of four persons three of them had typhoid fever. I ought to add that in nearly every house some one was sick. In No. 6 there was a case of erysipelas, and so on.

Cases of **Phthisis** are frequent. Infection, hereditary predisposition and unsanitary conditions are the principal causes, while imperfect ventilation and dampness undoubtedly increase the phthisical tendency.

Mrs. N. F. takes care of her husband's relative who dies of consumption. Mrs. N. F., who is forty years old and always of good health, belongs to a family in which consumption has never been known. In one year from the relative's death she begins to droop and in two and a half years dies of consumption.

I must detail to you two other cases of sickness which came before me last February. Two young women came to me for advice the same day. After a careful examination, I said to myself here are two cases of incipient phthisis. I watched them for a month and every rational symptom strengthened me in my position. At the end of a month I made a careful examination of the sputa in each case. In one there were millions of bacilli, in the other none. I was pressed for an opinion in each case and in the one I said consumption, in the other not. My diagnosis was correct, and to-day the first is no more, and the second is enjoying full health.

South Windham—N. M. MARSHALL, M. D.

The prevailing diseases in this town are bronchitis, catarrhal, throat, head and lung troubles. Scarlet fever has in all cases been sporadic, running the usual course; followed in one case by severe abscess of glands of neck. Several cases were followed by rheumatic affections. None fatal. There was a severe epidemic of diphtheria in one neighborhood in Windham, two miles from the village, seven or eight years ago. Nearly all the cases terminated fatally. In six years I have had several mild cases, but one very severe case in Windham. Throat troubles in this case were of the severest type; case was a child and recovered. Few cases of typhoid fever. There were three in one family at same time. Nearly all ran usual course. One case came on at Cumberland Mills Paper Mill in form of low or walking case; developed active symptoms; had long protracted delirium even after returning strength sufficient to sit up. Had no fatal case. In six years have had no regular epidemic of either scarlet fever, diphtheria or typhoid fever within five miles of this place. In the summer and fall of 1884 had an unusual number of cases of peritonitis, in males, cases being severe but recovered. One case with voice confined to whisper to this time. In 1882–4 measles and whooping-cough prevailed, several cases were complicated by pneumonia. There were three fatal cases; all the children were quite young. At the time should think at least one third or more of the entire population were sick, about three-fourths of same being children.

Diphtheria has not been prevalent in this place within six years. There were several severe cases of tonsilitis, but I did not regard them as diphtheritic.

Have had cases of **Typhoid Fever** which seemed to be caused by pollution of water by cess-pools, sink drains, etc. Have had none of special interest. Think unsanitary conditions the cause in all cases I have had; but two were unexplainable. They were in nice families.

Pulmonary Phthisis is very frequent in this part of the State. The more frequent causes of the disease are heredity, with lack of care. Without doubt, bad or imperfect ventilation influences, but it has been my observation that dampness here was the main cause. Nearly every one here suffers more or less from bronchial troubles. Very many will have no cough at all when in other places, and suffer all the time when here. Think I have never had but one case but what heredity was the primary feature; one case, of acute form, followed pneumonia. Have a case now under treatment which claims to have, as she says, "caught it from her husband," who is now dead.

The most common faults in **School-Houses** in this town are the same as all others. Too small, imperfect ventilation, or none at all, poor modes of heating (heads hot and feet cold), uncomfortable seats and bad light. Have had a large number of cases of general colds, "caught" while at school in our village. We have the meanest little 7x9 box in town for a school, employing a teacher who receives $50.00 to $80.00 per month. The house is located in the lowest portion of this section. School should be graded, there being one hundred scholars in the district. Headache is a frequent complaint. I know from experience, having been a teacher, and also two years on school committee. If a case of scarlet fever or diphtheria were found in the school, do not think much would be done by the proper authorities; some would be frightened and keep scholars at home.

Springfield—P. C. Jones, M. D.

The prevailing disease is debility from over-work. **Scarlet Fever** broke out in Springfield in 1859, and spread rapidly through Lee, Carroll, Prentiss, Kossuth, Topsfield and Lakefield. I kept no record of cases, but judge I treated three thousand cases in three years. **Diphtheria** then commenced in a most malignant form, and followed nearly the same track, with a greater number of cases and more deaths during the first year. The last two years of its violent run there were but few deaths. I have seen but four epidemics of **Typhoid Fever** in my practice. One in Bancroft and Weston, one in Talmage, one in Springfield and one in Lee. Have had more or less every year during thirty-six years practice. I have probably treated as many cases of diphtheria and scarlet fever as any man in the State, and many cases of typhoid fever.

There is probably as much **Diphtheria** here as in any place. Some cases were said to have been contracted at funerals.

I think I have seen cases of **Typhoid Fever** caused by impure water. Recurrences in the same place in successive seasons have been noted.

We have considerable **Consumption**; causes mostly heredity.

Springvale—IVORY BROOKS, M. D.

Springvale (in which I have practiced medicine since July 24, 1844), is a village in the northern part of the town of Sanford. Twice **Small-Pox** has appeared here. The first time it was brought by a family that moved into the tavern in February, 1846. It was not recognized early, so it got a large spread. I had no care of it, so the selectmen set me vaccinating. It cost the town (estimated) about $1500.00, and nearly ruined business in the village of Springvale all that summer and fall. The second time it was brought here by some one who came here fishing through the ice on the ponds for pickerel, and said to have drank from the same bottle with others. One family was carried to the pest-house, and I had the care of it, the man, only, dying. The other was in the woods and remained there; two died and others took it. Cost $400.

Diphtheria has been here four times or more. The first time it was general and quite fatal and lasted from September, 1861, to January, 1862. The irregular practitioner lost his first thirteen consecutive cases, his fourteenth fell into my care and did get well. The second time in November and December, 1863. The third in February and March, 1878, and the fourth time in December, 1883. This time it occurred in a family on high land on the eastern ridge, in one family only (a wealthy farmer), and took off five daughters (young ladies) and one granddaughter. A son and son-in-law barely escaped with life. I thought the first time it was checked by removing children from school, yet some had it who were never at school nor saw any one sick with it.

I had one family under my care where one after another were taken sick with **Typhoid Fever** (three, I think, perhaps four) when I requested that all polluted soil be removed from about the sink drainings and carted to plowed ground at a distance, and return be made by fresh soil, which was done, and no other one was taken down with the fever. This only proves that no harm was done thereby. From 1844 to 1854 I never saw a typhoid fever case. In 1854–55 and '81 typhoid was most severe and fatal, especially in 1854–5. Sporadic cases have occurred intermediately.

I should think that **Phthisis** is less frequent than formerly. There were in this vicinity three families that became extinct save one son in each family. One of the above-named sons is the esteemed gentleman whose five daughters and one granddaughter died of diphtheria in 1883. The other two families lived and died on the south-western ridge, neither of them in the vale by the river.

Our **School-Houses** are too often located in too damp locations, and ventilated by cold air pouring too freely and directly upon scholars' heads. Headache troubles the scholars much.

St. Albans—E. A. Bean, M. D.

The prevailing diseases in this town are pneumonia and consumption. Scarlet fever, diphtheria and typhoid fever have not been present to any extent for three years past. Some five years ago an epidemic of diphtheria visited this town. Typhoid fever has not been present with the exception of one or two cases. Small-pox has not visited this place for many years.

I will give the following as an example of the way in which **Scarlet Fever** seems to retain its vitality: When I moved into St. Albans, the house into which I moved had been occupied by a family with one child. The house had been thoroughly cleansed. A few days after I was settled I called to see the child of the family before mentioned. He had had convulsions and was feverish. He soon improved and I thought it a case of cold and indigestion; but a few days later, about ten after my entering the place, one of my own children was taken with a very mild form of scarlet fever, and a little later on the other was taken quite violently with the same disease. Upon inquiry I learned that the child above referred to had been out of town to a funeral and that a few days after returning he had had a slight rash with a little fever; but was not sick enough to take the bed. No other cases occurred. I could give conclusive proof, if space allowed, that my children took the disease from the rooms into which we moved.

Diphtheria has not been prevalent in this place since 1880. To illustrate the causation of the disease by unhealthy conditions I will give the following case: Was called to see a child with diphtheria, and on looking around the premises I found the well in close proximity to the privy vault, which was very foul. I forbade the use of the water and no more cases occurred.

Stetson—I. W. TIBBETTS, M. D.

The prevailing diseases are consumption, pneumonia, typhoid fever, asthma, and a large amount of dropsy and paralysis. I have noticed, as a peculiarity of our diseases, that dropsy and paralysis are confined to neighborhoods. I have now seven cases of paralysis within four miles, and, in another neighborhood, five cases of dropsy. The two diseases are in different parts of the town. Four cases of paralysis have occurred within the distance of one mile. Scarlet fever was epidemic in 1875, at which time forty cases occurred. I have had but one case since. I find isolated cases of diphtheria nearly all the time during the spring and fall months; and in a portion of my practice outside of the town, where there is a horseback on which nearly all the inhabitants live, and on each side of which there is much low land, and on one side a stream, there is hardly ever a year when some are not having diphtheria, and the most fatal cases are in this section. Typhoid fever will not average more than five cases each year in town; and have never, in twelve years of practice here, seen an epidemic of it. Small-pox has been in the town twice within twenty-five years.

I have known the contagion of **Scarlet Fever** to retain its vitality in rooms more than three months. I believe it is caused by direct contact with the germs of the disease, as every case of mine except one were traceable to such contact.

I believe the air of cold clayey marshes has a direct tendency to favor the spread of **Diphtheria,** as nine-tenths of cases occur in such localities. Diphtheria will spread in schools if the schools are not closed, which has usually been done.

Water-pollution as a cause of **Typhoid Fever** I have noticed in my practice, and so have I seen cases recurring in successive years in the same places.

The most severe cases of typhoid fever occurred in a family where, on asking them for a drink of water, I noticed a very offensive smell and taste, and asked the father when he cleaned out his well. His answer was, "I have lived here ten years and have never cleaned it out." "How long has it been dug?" "About forty years." "Was it ever cleaned out?" "Not to my knowledge." I ordered it cleaned out at once, and decaying frogs, snakes, toads, angle worms and about two feet of offensive smelling mud was found. The barn is situated on the very top of a hill. House just below, well low down on the hill. Barn sets on ledge which slopes off so that there are six feet of earth at well before striking ledge. Remaining twenty feet of well blown in ledge.

Cases of **Phthisis** are quite frequent. As a cause I should give prominence to insufficient clothing and exposure, with the germs of the disease in the lungs at birth. Bad school-house air is not a cause in my opinion. Nearly all have parents or relatives who have died with this disease. I do not believe it to be infectious.

Over-heating at some parts and extreme coldness of others are faults with the **School-Houses**. If diphtheria should appear the school would be stopped at once.

St. George—A. WOODSIDE, M. D.

The prevailing diseases are pulmonary phthisis, pneumonia, typhoid fever, diphtheria, etc. I have noticed no peculiarities in our diseases except that typhoid is often complicated with malaria. Many of our cases of typhoid fever come from southern ports, and this accounts for the malarial element. We have had no small-pox for the last twenty years. Four times previous to that date small-pox was brought to this town.

Eleven years ago clothing was sent from a family in Massachusetts in which there had been several cases of **Scarlatina**. The disease was communicated to the family where it was sent, and from them to others, when it became epidemic, and during the fall and winter of that year, 1874–5, there were nearly one hundred cases, apparently all originating from this one family, which had been infected by the clothing above mentioned.

Diphtheria has not prevailed in this village (Tenant's Harbor) but once for eleven years. From August, 1884, to March, 1885, there were forty-one cases of diphtheria here. The sanitary conditions, so far as I am able to learn, are no different from what they have been the past ten years. This disease has been in other parts of the town three times within ten years.

In one house where **Typhoid Fever** had been in a family a school teacher went to board. She took the disease and died. Soon after a young lady went to assist the family and she also took the disease and died. The disease in these cases assumed a very malignant type. The next year a school teacher again boarded there and was soon prostrated with typhoid. She recovered. The disease was supposed to originate in the cellar of this house, where there were decaying vegetables and other unsanitary conditions.

Cases of **Consumption** are quite frequent. In this town it seems to be occasioned by intermarriage of those families in which there is a heriditary tendency to this disease. Imperfect ventilation is one of the important factors in producing this disease here.

In the older **School-Houses** the rooms are small and poorly ventilated.

Sullivan—F. W. BRIDGHAM, M. D.

The prevailing diseases are of the respiratory organs, and rheumatic disorders. During the past eighteen years, have had two epidemics of typhoid fever, three or four of scarlet fever (one of malignant type), two of diphtheria—one during the past winter; a number of sporadic cases of above disorders every year, generally easily traced to unhealthy surroundings. Small-pox has invaded the town but once during my residence here (18 years). The disease was contracted by a sailor, in Boston; confined to one family. Cost, as nearly as I can estimate, $150.

I recall a case of **Scarlet Fever,** caused by wearing a pair of socks (sent home from Lowell, I think), belonging to a young man who had had the disease in Lowell. No other case in this vicinity at the time. I have known of several cases where families had moved into rooms not thoroughly cleansed by former occupants suffering from this affection. This was after the lapse of six or eight weeks. I have seen cases where it seemed impossible to trace scarlet fever to any other source than to unsanitary conditions. Have noticed that the type was much more severe where the sanitary surroundings were bad, inclining to the anginose form in damp situations. I think about three-fourths of my cases were due to infection.

Diphtheria has been prevalent here. The more frequent causes are contagion, filth and bad sanitary surroundings. There were in East Sullivan last winter, five cases of diphtheria in one family, which occurred after the visit home of a daughter who had had the disease in Bar Harbor, but apparently had fully recovered. No other cases occurred in that vicinity. Two years ago I had three cases in one family; no other cases within twenty-five miles. Caused, no doubt, by a cellar without a drain and half full of stagnant water. Four cases in one house last fall; no other in this vicinity; caused by the use of brook water fouled by cattle droppings and some human excreta from quarrymen at work further up stream.

I have noticed cases widely separated springing up one after another as long as school continued, which seemed to grow less frequent after closure of school. I have always advised private funerals; so have not observed its spread from this source.

Yes, many cases of **Typhoid Fever** have come under my observation, apparently caused by the fouling of water from cesspools, privies and similar places. I recall three fatal cases where the privy deposits had accumulated for a number of years on the ground under privy without vault and without proper enclosure; the well within thirty-five feet.

Three cases in one family in Gouldsboro'; no other cases at the time in that or neighboring towns. The house was situated on high land in a very healthy spot. Disease traced to sink droppings which fell on ground from a short sink spout, directly under windows, close to the cellar and within forty feet of the well.

Phthisis is quite frequent. The causes in most cases coming under my observation, have been hereditary influence and neglect of bronchitic attacks. I have never seen a case that could be fairly attributed to the bad ventilation of school-houses. As illustrating the hereditary tendency of consumption, I have at present under my care two sisters; one has incipient phthisis, the other has occasional attacks of hæmoptysis. Their grandmother died from phthisis; their mother with the same; one sister and one brother with the same. Have under treatment now a lad of sixteen who, up to last year was stout and rugged, now suffers from incipient pulmonary phthisis and tubercular kidney. His father and mother both died with phthisis and as near as I can learn his mother's mother died from same cause.

The most glaring defects in our **School-Houses** are the faulty ventilation and poor privy conveniences. I have noticed many cases of headache during school terms and the prevalence of colds from over-heating the head and chilling the feet. In case contagious diseases should appear in our schools closure of schools and fumigation of building would be done.

Thorndike—J. C. Whitney, M. D.

There has not been much scarlet fever or diphtheria here for a number of years. From 1864 to 1870 diphtheria was quite prevalent. In those years where it commenced on the hills it followed the hill as a rule, and when the first cases were in the valleys a great majority of the cases remained in the valleys. Small-pox has never to my knowledge been in the town.

We have had no **Diphtheria** for the past few years. The more frequent causes are exposure to cases which have the disease and neglect to cleanse and disinfect rooms after this disease. One instance I remember in which one child in a family was sick with diphtheria and after her recovery the room was unused for four weeks, but no disinfection was used. At the end of the four weeks they took up the carpet and during its removal another little one that had not been allowed in the room during the sickness of the first child, ran in and out as she pleased. The result was she soon had the diphtheria.

Our **School-Houses** are not well ventilated and the floors are cold; considerable headache.

Troy—M. T. Dodge, M. D.

The more notable of our diseases are consumption, catarrh, rheumatism and neuralgia. **Consumption** has caused more deaths for the two years that I have been in practice here than any three other diseases. For the last ten years there has been no typhoid fever, scarlet fever nor diphtheria in town. One circumstance I will mention which has attracted my attention and leads me to think that perhaps atmospheric conditions play a more important part in the causation of diseases than is generally thought. It most frequently happens that if I am called to a case of tonsilitis, bronchitis, summer complaint or pleurisy, I have several more cases of the same disease within a few days. Last October I had eight or ten cases of acute cystitis within as many days—more cases than I have before had in two years of practice. Small-pox has been here only once that I am aware of. The cost to the town was not great, as the disease was confined to one family who, living upon a by-road, were, by fencing up the road, completely isolated.

I have from observation become quite well satisfied that **Diphtheria** is communicable, but it behaves queerly in this respect; I have noticed that it has, in several cases, made its appearance where it seemed next to impossible that it could have been taken from another patient.

In a case of **Typhoid Fever** which I have in mind the well was very near the privy and the water decidedly bad.

Phthisis is quite prevalent and the causes seem to be climate, hereditary tendency, want of care of one's person, want of suitable food to enable one to withstand the changes in the climate.

In our **Schools** there are low ceilings; rooms heated by cheap, cast-iron stoves, with funnel passing over the heads of the scholars; cold floors; poor seats and desks. Colds are very common among both teachers and scholars during the winter schools. Much complaint of headache.

Turner—H. L. IRISH, M. D.

Affections of the air passages are quite frequent.

Scarlet fever has prevailed here several times, once very fatal in character. Diphtheria and typhoid fever have not prevailed to any great extent for twenty years. Small-pox has appeared three times I think. It was brought from Washington, D. C., last time and was not very expensive for the town.

There was an outbreak of **Scarlet Fever** at Westbrook Seminary when I was a student there. It was very fatal and the sanitary condition was bad.

I must say that I have not been able to demonstrate to myself that filth has anything to do with **Diphtheria**. I had one case which was caused by a relative coming into the family who had been attending a case twenty miles away.

There was an outbreak of **Typhoid Fever** about eight years ago at West Auburn near a shoe shop. All used the water from a well near by and many had typhoid. Did not visit any there, but some came home to Turner and were very sick.

Unity—JAS. CRAIG, M. D.

For the past two years catarrhal diseases have predominated. During the past ten years I have not known of an epidemic of scarlet fever, diphtheria or typhoid fever in my field of practice. A few isolated cases of each. Small-pox invaded the town once several years ago.

I will give an account of a case of **Scarlet Fever** which will illustrate one way that the contagion may be conveyed. A young gentleman was visiting at a house where they had had scarlet fever the year before. During his visit the annual house-cleaning was in progress. Soon after his return home he came down with scarlet fever. There were no cases within my knowledge at the time. I am confident he contracted the fever from the house. Have known of cases in which the contagion retained its vitality nearly or quite one year. Every case that I have treated could be traced directly to contagion, while the sanitary conditions determined the type of the fever in every instance. My practice in this disease has not been extensive, having had only twenty-two cases in ten years' practice.

I have not known of a case of **Diphtheria** in this village for ten years. Three and five miles away I get cases, but no epidemics. In my opinion the most frequent cause of this disease is unsanitary conditions. I have never yet seen a case of diphtheria that I could pronounce with any degree of certainty due to contagion, but if the disease developed in a family where the conditions were unhealthy, all of the children were sure to have it.

My field of practice is exempt from **Typhoid Fever.** In a practice of ten years I have had only three cases. I have never known a case in this village, nor can I learn of a case developed here. I attended a patient brought here sick with the fever. I had the discharges thoroughly disinfected and disposed of, and all clothing disinfected before being washed. No other cases developed. I had one case that I considered due to filth of the most pronounced character. The sanitary conditions about the buildings were fair, but within, a hog pen was clean in comparison. The patient died in the third week of the disease from exhaustion. No other cases developed from this.

In my field of practice **Phthisis** is not particularly prevalent. An ignorance of the laws of hygiene, improper dress, poor cooks and criminal abortion, have much to do in causing this disease, in some cases at least. It is my observation that the majority of cases are produced not from one cause alone, but from several combined; imperfect ventilation and dampness are important factors in causing phthisis, I think; also, that the miserable air in our school-rooms very often lays the foundation of the disease. As bearing on the question of the contagiousness of phthisis, I have observed this fact, that if the husband dies of consumption the wife usually developes it within two years.

We have not a fairly good **School-House** in town. Poorly warmed and ventilated, seats not suitable for a child to sit on. I think about five per cent of the pupils are absent on account of sickness. Headache is a very prevalent complaint.

Van Buren—T. H. Pelletier, M. D.

The prevailing diseases are acute rheumatism, nephrites, pneumonia, usually followed by speedy convalescence.

Diphtheria has been epidemic only once, in 1882. Scarlet fever epidemic about every four or five years, never very fatal. Small-pox has been in this town once. Contracted in foreign country; affected only two members in one family; cost about $20.00.

Diphtheria when found is usually in unhealthy localities. Families of five and six members affected and two-thirds of cases proving fatal; other larger families in same street and under same atmospheric influences not affected. Such observations would seem to point to localized causes.

Vanceboro—Wm. Beatty, M. D.

Typhoid fever is the prevailing disease in this place.

Diphtheria has been quite prevalent. Its cause, in my opinion, has frequently been bad ventilation. Often found in families crowded into small tenements. In this year there have been nine cases of diphtheria among children, resulting in four deaths.

The most common faults in the **School-Houses** here is the want of proper ventilation.

Vinalhaven—G. W. Phillips, M. D.

Of the native population it is safe to say that they are blood relatives. Bronchial and catarrhal difficulties are the prevailing diseases. I have noticed that (1) all febrile diseases run a rapid course here;

(2) general irritability of the stomach, drugs in expectorant doses acting as emetics; (3) early arrival of puberty. Two years ago measles attacked old and young. Have seen no scarlet fever and but two cases of diphtheria proper, although inflammations of the throat called such are frequent.

Phthisis is often encountered here. Stone dust among the stone cutters and the dampness of the atmosphere are exciting causes. Repeated and neglected attacks of bronchitis and an hereditary tendency are the adjuvants.

It is claimed by one of the physicians residing here that no case of **Typhoid Fever** ever originated on the island. I must admit that the cases which I have seen could have been received elsewhere, but the poor water and bad surface drainage to be found here caused me to think the case will yet be found. Bilious gastric fevers, summer diarrhœas and dysenteries are frequently met.

In September was called to a house on a side-hill. Privy and drain always to be smelt, and found a boy of fourteen with typhoid fever. This was a typical case in every way. Before November every member, to the number of fourteen, was attacked with a fever or a diarrhœa, some having both or repeated attacks. The fever would last a week or ten days with early recovery. That hill and neighborhood furnished the most of the business of that period to the physicians. Those of the people who kept about their work came to our offices complaining with headache, loss of appetite, weakness and looseness of bowels.

Waterford—C. L. Wilson, M. D.

No marked epidemic has prevailed since my residence here.

I know of one instance where, after a mild case of **Scarlet Fever** in March, bedding was cleansed thoroughly and packed away. The next winter it was needed and was assigned to the use of one member of the family, who contracted the disease from it. This was the only case anywhere in the vicinity.

One case of a young lady at work in a village some twelve miles distant where **Diphtheria** was prevailing extensively, had a mild attack, came home, being able to walk most of the distance. On her arrival her brothers and sisters embraced her. They were all attacked with a malignant type of diphtheria and one died. The young lady visited her aunt and another family where there were four children who took the disease and one died. No other cases in the vicinity.

Cases of **Phthisis** are not frequent.

We have a good class of **School-Houses** in town; well arranged with regard to ventilation and light, and the location is usually good.

West Brooksville—J. T. SMITH, M. D.

In the western part of the town, at present, scarlet fever is prevailing in epidemic form. I cannot say we have any really prevailing diseases, unless it is a tendency to inflammations of the respiratory tract. I had, especially last January, February and March, many cases of pneumonia and acute bronchitis. The older people and adults in general seemed to feel the effects of the bronchial epidemic early in 1885, and it was not till late in spring that children were affected to any great extent. About eight years ago there was an epidemic of diphtheria which was very fatal. **Typhoid Fever** is not indigenous. Occasional cases have been noticed, but the disease originated elsewhere. **Scarlet Fever** has been prevalent since August. The first case was a little girl eight years of age. No history of exposure to scarlet fever, and no cases have been seen in town for more than six years. Could get no clew to its origin. Child had been sick in Bangor last June with sore throat. Her mother said that the attending physician called it diphtheria. The disease has gradually spread, attacking by preference the poorer families and those the least under influence of cleanliness. So far the epidemic has been very mild, with only one fatal case. Small-pox has been here only once to my knowledge and then confined to a single family by quarantine. Probably brought by sea-faring man who came home sick. His wife soon sickened. The cost to the town was about fifty dollars.

Typhoid Fever very rare here and the two cases I have seen were imported. No other cases followed. Antiseptic precautions observed. No other cases noticed and these two were not at all associated. I have no doubt, judging from condition of homes in relation of out-buildings to dwelling-houses, that if typhoid fever should get a start it would rapidly become epidemic.

Phthisis is quite prevalent. Causes seem to be heredity, exposure, neglect in case of colds, etc. To dampness, which is observed in a number of dwellings here on account of imperfectly drained cellars, is due a catarrhal condition of respiratory tract which in majority of phthisically inclined here is noticed for a time before the disease is pronounced.

In our **Schools** there is imperfect ventilation; properly speaking, none at all. In two or three imperfect light.

West Harpswell—G. A. Harlow, M. D.

We have considerable of lung troubles and little of typhoid fever. There has been no scarlet fever or diphtheria in my field of practice and no epidemic of typhoid fever. There have been no epidemics here except measles and whooping-cough, which were mild in character. Small-pox has been in town once. I had one case the present season; that of F. W., who contracted the disease in Montreal and was taken sick in eleven days after exposure. Expense to town $30.00.

Phthisis is quite prevalent, the causes seeming to be fog, damp air and hereditary predisposition. Dampness has more to do with producing the disease than imperfect ventilation.

Most of the **School-Houses** are old fashioned, cold, badly ventilated and poorly lighted. Headache is quite prevalent.

West Newfield—Stephen Adams, M. D.

The prevailing diseases were formerly typhoid fever, dysentery, colic and consumption, but these have forsaken us; has not been a case of typhoid fever since 1868 and but very few of the others named. **Small-Pox** has been in town four times to my knowledge. Feb. 2, 1864, I was called to a case of small-pox and was attending a number of patients with other diseases which I visited regularly and did not communicate the disease to them. Before leaving the house I disinfected my clothing with the chloride of lime. One night *my horse* became restive while I was in the sick room and I ran out without disinfecting my clothing and moved him to a shed. He became sick, would not eat, and some pustules came on his lips. Soon I had varioloid but was not much sick. My son came into my room though I remonstrated against it. He took the disease and had it in full force, covered with pustules from top of head to bottom of feet. I was vaccinated forty-two years and my son twenty years, previously. Twice the disease was brought by tramps. Had two cases of cholera; both recovered.

Alcoholic Liquors are the great unsanitary curse with which we have to contend. We have had many trials side by side of liquor and no liquor, result always favorable to water.

In 1865 a family had eight sick with typhoid fever. One was treated with whiskey and died; seven had no liquor and all recovered. In 1868 twenty-two were sick in a small village; one was treated with whiskey and died, twenty-one were treated without liquor and all lived. Since that year there has not been a case in town.

For several years past cases of **Consumption** have been very rare. Some years ago Rev. ——— testified in an ecclesiastic court that he went to the —— House to get some Bourbon whiskey, because he had a lung trouble. Immediately scores of orders went down country for Bourbon whiskey, and one day it was said the stage driver carried by here ten bottles for people who fancied they had a lung trouble; and there followed an epidemic of consumption. There were more deaths in two years than there has been in all the years since.

Windham—B. F. Dunn, M. D.

The more prevalent diseases are pneumonia, bronchitis and diphtheria during the cold months. Diphtheria prevails more in the spring than in any other part of the year. Sixteen years ago a severe epidemic of typhoid fever prevailed which was very fatal. Typhoid fever has been characterized for a number of years by its mildness of type. Ten years ago there was quite an epidemic of scarlet fever during the months of August and September. In the winter of 1875 a severe and extremely fatal epidemic of bronchitis and congestive pneumonia visited us.

I have in mind one very unusual and interesting case. A young girl seven years of age was exposed to the contagion of measles. Soon after was exposed to scarlet fever. In due course of time, she came down with measles, the eruption well marked for about twenty-four hours, when the measley eruption gave place to the scarlet eruption, and its accompaniments, which ran its course of the usual time or a little longer perhaps, when the measley eruption re-appeared and run its course during one day. The patient did well although convalescence was a little protracted.

There has not been a year since I came to this town when there has not been more or less **Diphtheria.** The cases here in the country seem to me arise more from infection than contagion. There are families in which there are from three to five children and one case of malignant diphtheria will occur and no other member have the disease.

Cases of **Phthisis** are frequent, caused largely by exposure, heredity and pneumonia. There was a family living in a neighboring town, consisting of seven members including parents, and I think in less than two years all but one died with phthisis. I have no doubt that in these cases infection had much to do in the propagation of the disease.

The **School-Houses** in this town are too low and close.

Winthrop—A. P. SNOW, M. D.

The prevailing diseases are the same that occur in other healthy localities in Kennebec County; and I have not noticed any peculiarities in the diseases of this neighborhood. Within the thirty-one years that I have been in practice in this town there have been several more or less extensive epidemics of scarlet fever mostly of a mild type, attended with a small percentage of fatal cases. Diphtheria was unknown here previous to 1861, and can hardly be said to have prevailed as an epidemic. The same may be said of typhoid fever as a prevailing disease. With the exception of whooping-cough and measles there have been no other prevailing endemic or epidemic diseases within our borders. I do not remember that any of our schools have been suspended on account of prevailing epidemics. Within the last thirty years **Small-Pox** has twice invaded this town. On the first occasion it was brought here by a returned soldier. It was varioloid, and was not recognized by his attending physician. Consequently there were six or eight other cases in town, all of which were modified by previous vaccination, except in the case of a young son of the soldier who had unmodified small-pox, from which he recovered with considerable pitting of the face. These cases were all treated at their several homes under the regulations adopted by the physicians, and were not attended with any public expense. On the thirteenth day of June, 1880, two young men who had never been vaccinated went to Mechanic Falls to attend the funeral of their grandmother who, it was afterwards supposed, had died of small-pox. They found their mother sick in the house of the deceased with what the family and doctor called chicken-pox. On the 19th I was informed that the disease at Mechanic Falls was undoubtedly small-pox, and that the young men had been thoroughly exposed. I immediately vaccinated them and the next day had them go quietly into camp on an island in Annabescook Lake, three miles from the village, to await results. I visited them the 24th and found that the vaccinations showed indications of taking well in both cases. R. M., the older of the two, was also suffering with severe headache, backache, quick pulse, high temperature and other unmistakable symptoms of small-pox. The next day, the 25th, the eruption began to appear abundantly and the case developed into one of genuine confluent small-pox, unmodified in the least by the vaccination so far as I could observe. On the first of August this patient was so far recovered that I was able to discontinue my visits to him. The brother remained in camp with R. M. during the whole of his sickness, acting as assistant nurse, and had no form of the disease. His vaccination took thoroughly in two places. There were no other cases. The cost to the town was between $300 and $400, and to the family and friends about half as much.

Diphtheria has never prevailed to a great extent in this town, and during the last ten years there have been but very few cases. It has not always been practicable to trace the exact cause of some cases, but in most cases I believe the cause to have been contagion. As examples: Mr. and Mrs. C., with their child about three years old, went some thirty miles to visit friends in whose family, the week before, a child had died of diphtheria. After two or three days their own child became ill, when they immediately returned home. But the child soon died, a victim of the dread disease. No other cases. The only child of D. W. W. was taken suddenly sick with malignant diphtheria, and died on the fourth day. The young mother, in her grief, often passionately kissed the child upon its lips during its sickness and after its death. The next day after the death of the child the mother began to show symptoms of the disease, and within a week she was buried beside the child she loved so fondly. There were no other cases in that neighborhood.

Pulmonary Phthisis is quite a frequent disease. I believe that hereditary liability to the disease is the most frequent cause, but climatic influences, imperfect ventilation of dwellings, infection or contagion, etc., play an important part in its development. To illustrate infection or contagion as a cause. I have in mind several wives, and a few husbands, belonging to families without hereditary liability to consumption, who have lived with consumptive companions, and who have themselves fallen victims to this disease. Also nurses who have apparently contracted it in the care of their consumptive patients. Mr. D. became engaged to a young lady, one of a family of nine children, without any hereditary liability to consumption. He belonged to a consumptive family, and soon began to develop tubercular disease of one lung. As his health became feeble the young lady was with him a good deal as companion and sometimes as assistant nurse. Within a year she became consumptive herself, and died within a short time after the decease of her lover. The father and mother, and all of the sisters and brothers of the young lady, are still living in good health.

More than half of the scholars in this town attend school in the village, where we have a fine new **School-House.** The building is heated with steam and provided with the necessary facilities for ventilation and the comfort and health of teachers and scholars. All of the surroundings are of the best, in a sanitary point of view, except, perhaps, the privy arrangements or its management. All the other school-houses are in good condition, and without special faults in a sanitary point of view.

Wiscasset—C. A. PEARCE, M. D.

There are no diseases remarkably prevalent. About five years ago we had diphtheria. It was brought here but was soon stopped, although it spread some by contagion. Small-pox has been here twenty times in fifty years. Each time it was brought here by some person, but never allowed to spread. No expense to town. Older portion have been vaccinated, the younger ones have not; say one half the whole.

Cases of **Typhoid Fever** have come to my notice, caused by such unsanitary conditions as you enquire about. I have in mind a house where typhoid fever occurred about one year ago, where the sanitary conditions were bad. Could find no other cause for the fever than a very bad accumulative privy, where the discharges of former typhoid patients had been thrown a year or two before.

Cases of **Phthisis** are not very frequent; what I do find are usually due to inherited tendency. I believe that bad ventilation and dampness hasten the development, and the bad ventilation of school-houses undoubtedly lends its influence in the same direction.

Bad ventilation and improper heating is what I should complain of the most in our **School-Houses.** To these causes I think that the poor health of several young ladies who have come under my observation is due. A small per cent. of the children are absent on account of sickness, but headache is very frequent. Cases of scarlet fever or diphtheria in the schools would be isolated.

Yarmouth—J. C. GANNETT, M. D.

The prevailing diseases in this town are pneumonia, influenza and tonsilitis. In the summer and fall of 1884 we had the whooping-cough; in the spring of 1885, scarlet fever; three or four years ago, 1882, in the summer and fall, diphtheria, with an occasional mild case since. Disorders of the kidneys are frequent. The catarrhal affections of the past winter and spring have shown a marked tendency to extend to the ears, involving the eustachian tube and middle ear. The scarlet fever cases were mostly confined to our locality, a collection of half a dozen houses on a road running out of the village near the river. The cases were mostly of a mild type, some more severe characterized by diptheritic deposit in fauces and pharynx, others having rheumatic affections as sequelæ.

But one death occurred among these cases, a boy 7 or 8 years of age. In this case the virulence of the disease was very markedly shown by the abundant corrosive discharge constantly flowing from nose and mouth. The diphtheria of three years ago was almost entirely confined to two or three houses, the sanitary conditions of which had been shamefully neglected. The cases, the worst of which occurred in July and August, were extremely virulent, four or five deaths in a total of from twelve to fifteen cases occurring. In November and December of the same year several mild cases occurred in the same houses.

Think the cases of **Scarlet Fever** occurring in the spring of 1885 must have spread from disease germs in the carpets, &c., of the houses first affected, because efforts at disinfection were not fully and carefully made. Three-fourths, perhaps, of the cases were due to infection derived from other cases.

We have had a few short visits of **Diphtheria,** but not endemic. Filth and poor water, dirty and damp cellars and decaying vegetable matters, have been the more frequent causes of the disease. The cases cited above were nearly all in a quarter and in houses notoriously filthy and poorly supplied with good water. The locality is near a cemetery, the soil of which, thoroughly permeated with decaying animal matter, is deep, loose sand, drainage being toward and into a small brook at the back of these houses. A spring of water is also located on the bank of this brook, the water of which is used by these families.

A strong exciting cause of phthisis seems to be the nearness of the sea with its variations of temperature and humidity, and the running together of fresh and salt water.

Yarmouth—W. W. THOMAS, M. D.

Catarrh, bronchitis, pneumonia, rheumatism and the various neuralgias are the principal diseases. In the past fifteen years we have had of **Scarlet Fever** only a few sporadic cases until last winter and spring, when we had about twenty-five cases with two deaths. The disease was accompanied by many complications and sequels, and many of those that lived through it were very sick for a long time. Great fears were entertained at one time that it would sweep through the whole village, but it was finally stamped out by sanitary measures, leaving hundreds who had never had the disease. In fact but very few of our people have had it as yet.

Coming here in 1870, I did not see or know of a case of **Diphtheria** in this town until the summer of 1881, a period of eleven years. Then a family moved here from the town of Lisbon, where the disease was then prevailing, and in less than a week the three children came down with diphtheria. Precautions were taken to prevent the spread of the disease and it did not spread immediately. It was *six months* before the next family of four children came down with this dreaded disease. But they had become very intimate with the family that had it first. The same precautions were taken as in the first case and no further spread of the disease at that time. But in about *six months*, July, 1882, it burst forth in its most malignant form in an old tenement house, containing three families, in which, and around which, the sanitary conditions were very bad. In the seven cases previous to this there had been no deaths, but there were twelve cases at once which resulted in the death of one man and three children. The house was cleared out and thoroughly disinfected and the disease was thought to be effectively stamped out, but *six months afterward*, in the winter of 1883, a mother who had lost a little boy by the summer visitation came across his cap, which had been packed away all these months, and gave it to a little boy living in another tenement, containing three families. In a week this little boy was dead from diphtheria. Two of the families had the disease and lost two children in each. The other family kept by themselves, used disinfectants and escaped. These cases had all been at the upper village, Yarmouthville. Now one of these families, who had lost children in this last house, moved to the Falls village in about *two months*, into a part of a house. The other part was occupied by a widow with three children, one of whom was a little girl. This little girl visited the family that had just moved into the other part of the house, and the lady, thinking perhaps of her own little girl that she had so lately buried, and wishing to please the little one, took from a drawer a handkerchief and gave her as a present. In about eight days this little girl was dead from diphtheria. The little boys were sent away when their sister was taken sick and thus escaped. I must let this brief history of diphtheria in our town suffice, as to go further would carry me too far for this article. It is enough to show the infectious nature of the disease. It also shows, I think, that a case of diphtheria without infection is rare. I cannot believe in the spontaneous generation of an infectious disease. Crowded tenements and filth help to spread the disease and render it more malignant, but that they can produce it *de novo* I am hardly persuaded is true.

The history of **Typhoid Fever** in this town may be written in a few words: we do not have typhoid fever unless it is brought here by some one coming home sick with it. I judge that we have had no more than thirty cases in the past fifteen years. We have but very few wells in the village. Most of the people depend upon cisterns for their water, while an aqueduct supplies a part of the village. I have never had more than a single case of typhoid in a family. The precautions taken are to have all the discharges from the patient disinfected and immediately buried in a deep trench. When this is done with the first case no second case appears. We have had no epidemics unless it be influenza.

In 1872 we had two cases of **Small-Pox** with one death, and two cases of varioloid; and in 1873 we had one case of small-pox. In the first instance it was brought by a sailor returning home. In the second instance by a man going to Boston and bringing it back with him. He did not get vaccinated in 1872 because he did not "believe in it." When he "broke out" with the disease his wife and three children were vaccinated in several places, which took well and they remained with him and not one had varioloid. *He believes in vaccination now.* These cases cost the town about $200 in money. The loss to business through fear of the disease was much greater, but can hardly be estimated.

In the spring of 1879 I was called to a family of three children sick with **Scarlet Fever.** I was puzzled for some time to know where they got it, as there were no other cases in town. The father worked in a shoe shop in Portland; going in on the train in the morning and returning by train at night. His children used to run to meet him and he would take the youngest in his arms and carry her back to the house. This one was the first to have it. The disease was prevailing in Portland at the time. The father learned afterwards that the man who worked at the same bench with him had scarlet fever in his family, but had said nothing about it for fear of losing his place. It is possible, however, that the father's clothes may have been infected while riding out in the cars. I have known of one case within a year where a girl nine years of age probably took the disease by sleeping in a room three months after children had had scarlet fever in the room. In this town no public funeral is allowed for those who die of scarlet fever or diphtheria. We treat them as small-pox in this respect. We put a red flag on a house having either of these diseases, and if one dies the burial follows as soon as possible.

Years ago I used to know of cases of **Typhoid Fever** recurring in successive seasons in the same homes, though I did not know then why some families were so afflicted; but think now that it was caused by infection from former patients. I know of a physician in Massachusetts treating a case of typhoid fever so lately as three years ago in such a careless or ignorant manner that he neither disinfected the discharges nor had them buried, but turned down the privy vault. The consequence was the family had two cases and one death the following year.

We do not have a large percentage of **Phthisis,** and a large proportion of our cases are among those living near the tide water of the river and on the heavy clay lands. Under my observation the principal causes are heredity, a heavy, undrained soil, thin-soled shoes, ill-ventilated school-rooms and close bedrooms, improper food and insufficient clothing, want of exercise in the open air and fear of sunshine.

We have three comparatively new **School-Houses** in town. These are built in modern style, are well ventilated, with good benches, etc. In the small outlying districts we still have some of the old abominations called school-houses, but fortunately in these districts there are but few scholars to attend.

York—W. L. HAWKES, M. D.

No epidemic of any kind since 1861. The epidemic of diphtheria at that time was of a severe form. In 1865, at Kittery Navy Yard, a man stole some clothing from an infected ship and died from **Yellow Fever**.

Diphtheria has been prevalent in this place, but of a mild form.

Have been in this town fourteen years and am not able to point to a single case of **Typhoid Fever** originating in the town. Our severe cases are in our young people leaving home and returning ill with the disease.

Cases of **Pulmonary Phthisis** are comparatively frequent. Although I am not able to give any cases in my own practice, yet I am a firm believer in the infectiousness of phthisis.

York—J. C. STEWART, M. D.

The diseases affecting the respiratory organs are the most frequent. We have had but one epidemic of scarlet fever since I came here in 1874; one of diphtheria and only sporadic cases of typhoid fever. Both those epidemics were confined to the eastern portion of the town, Cape Neddick, the scarlet fever being rather endemic than epidemic, that of diphtheria being the more widely diffused and properly epidemic. Some thirty years ago **Yellow Fever** became epidemic; communicated by a United States steamship at Kittery Navy Yard, and several of our citizens died. I know by report of the existence of small-pox here but twice. In both cases it was caused by direct contagion. Cost to town only nominal.

I think the unsanitary condition of localities has much to do in continuing an epidemic of **Scarlet Fever**. All my cases I think were due to contagion.

We have had one epidemic of **Diphtheria** since I came here, viz., 1876-77. Contagion is the cause. I say contagion, because when it appeared in a family it "went through it," but rarely appeared in other families whose members acted as nurses or watchers.

I have seen but four cases of **Typhoid Fever** in ten years.

Phthisis is quite common; caused by exposure and hereditary predisposition.

Our **Schools** are not properly heated. There are very few cases of headache. The patient would be removed at once and the schoolroom thoroughly ventilated if a case of scarlet fever or diphtheria should occur.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

BY FREDERIC HENRY GERRISH, M. D.,

President of the State Board of Health.

In 1872 a number of gentlemen interested in sanitary science and desirous of mutual increase of knowledge and of the wider dissemination of hygienic truth, formed themselves into a society for the study of all subjects relating to the public health. In each succeeding year this body, called the American Public Health Association, has met in some prominent place, always with growing attendance and augmented interest, has discussed the topics within its legitimate province, made valuable contributions to the store of sanitary information, and exerted a most wholesomely stimulating influence upon the public mind with reference to the dangers, the duties, and the rights of the people in health matters. The membership in the association is entirely voluntary,—an arrangement which insures a continuity of purpose and a wisdom of action, which are hardly possible in a purely representative body, with its *personnel* changing largely from year to year. The association now includes almost all the sanitarians in the country, and its utterances are entitled to and are received with the respect due to so distinguished, learned, and honorable an assembly. The Maine State Board of Health, believing that the purposes for which it was established would be advanced by having one of its members attend the meeting of the association, delegated its President to perform that duty, and he now presents a report of what he saw and heard, with some remarks suggested by his observations.

The meeting was held in the city of Washington, on the 8th, 9th, 10th, and 11th of December, 1885, the place and time being chosen with the hope of impressing Congress, at the very beginning of its session, with a proper sense of the importance of legislation regarding the public health. The National Board of Health, established in 1879, has fallen into great disfavor with the law-makers, and for a considerable time has been utterly crippled, owing to the withdrawal of congressional confidence and the consequent failure of appropriations; and the universal voice of the sanitarians of the country is crying for some organization which shall be so equipped with learning, experience, and funds as, at least, to be able to protect the land measurably against the importation of exotic diseases like cholera and yellow fever, which, in the past, have been so frightfully destructive of human life. The rehabilitation of the National Board, therefore, or the creation of a substitute for it which should be more to the liking of the National Legislature, was a chief object in view in the selection of Washington as the place for the thirteenth annual meeting of the American Public Health Association.

The attendance was large and strong in noted sanitarians,—men who have devoted their energies for many years to the solution of the problems of State Medicine, and have done inestimable service to the people by instructing them in the methods of right living. Throughout the meeting there were displayed the utmost earnestness and singleness of purpose. This was amusingly shown in a certain session of the advisory council. A gentleman, in urging the acceptance of an invitation to hold the next meeting in the city of his residence, with generous and amiable hospitality, expressed the desire and intent of his fellow-townsmen to give the association some pleasant excursions to points of great natural beauty and world-wide note. Immediately an ex-president of the association arose, and, while displaying full appreciation of the kindly design of the would-be hosts, declared with great emphasis that the association had no time for pleasure trips, but must devote itself entirely to business. The sessions were held forenoon, afternoon, and evening; every one came to get all the information and help that he could from every other, and all appeared to be convinced of the usefulness of the meeting.

Of the score or more of topics treated of by the essayists and discussed by the members, some may be dismissed with very brief mention, while others are of sufficient immediate interest to the public to receive more extended notice.

Dr. John S. Billings, U. S. Army, read a paper on forms of tables of vital statistics, explaining what may properly be included in such tables, and the best means of collecting and recording. This is a subject to which almost no attention has been paid in the State of Maine. The law requires the assessors, while taking the inventory of polls and estates annually, to ascertain by inquiry the births and deaths during the year ending on the last day of March, and make return thereof, to the town clerk, by the last day of April; and the clerk must annually make certified returns of the marriages, births and deaths occurring in his town to the Secretary of State, who is to file them in his office. But this statute is almost absolutely disregarded. Reference to the files in the office of the Secretary of State shows that only about five per cent. of the towns pay the smallest attention to the law. And yet its purpose is wise and beneficent. What would be thought of the sense of a man of business who kept no account of those goods which surpassed in value all the other articles in his stock? Human lives are the most valuable assets of a State; but in Maine it is impossible to ascertain how many are gained, how many lost, or what agencies are most potent in producing their destruction. Besides, under our law, even if it were administered perfectly, only a rough approximation could be made to the truth; for the collection of data is required so infrequently and in so slip-shod a manner, that accuracy is utterly impossible. A proper system of vital statistics is the only sure foundation of public health measures; for, without such, we cannot prove our necessities, or put a correct estimate on our achievements. Dr. Billings' paper dealt mostly with the processes to be employed; our people need first to be persuaded of the value of keeping any record whatever.

Dr. Salmon, of Washington, has investigated the swine-plague, or hog-cholera, as it is commonly called. He concludes that the disease which is so destructive of swine in this country is different from that which goes by the same name in Europe. The subject is of great importance, not only to the owners of hogs, who have lost about $30,000,000 by it in the last year, but to everybody else, on account of the danger to water-courses from the decomposition of the carcasses, most of which are not properly buried or burned, and probably, also, from the use of lard obtained by rendering them, and from the eating of their flesh. There is no evidence that the disease is directly communicable to human beings by contagion. The investigations are to be continued, and give promise of important results.

Dr. Bryce, Secretary of the Provincial Board of Health of Ontario, and Dr. Hingston, President of the Central Board of the Province of Quebec, gave accounts of the epidemic of small-pox in Canada, each from a different point of view; but as the story is told on previous pages of this volume, it would not be profitable to rehearse the facts in this place.

Dr. Chancellor, Secretary of the Maryland State Board of Health, read an essay on impure air and unhealthful occupations as predisposing causes of pulmonary consumption. According to the census of 1880, one-eighth of all the deaths in the United States are from Consumption. Foul air is one of the agencies which poison the system, and put it in a condition favorable to the development of consumption. Great stress was laid on the necessity of an abundant supply of fresh air. Very little attention is paid to the ventilation of our living rooms. We become indifferent to the close air in which we spend most of our time, and act as if it were inevitable. Consumption is, to a far greater extent than the majority imagine, a preventable disease; and the substitution of pure air for the ordinary foul atmosphere of our houses would result in a vast diminution in the mortality from this ever-present scourge.

Dr. Hartwell, of the Johns Hopkins University, presented a paper on the German system of physical education. In the city of Berlin, every child at school devotes two hours each week to physical exercises. These are continued all through the period of education, and so strengthen the body that the scholars bear the strain of study much better, and reach adult life with systems well prepared to endure the struggle for existence. The degree of perfection to which this training is carried in the army is illustrated by the fact that a squad of German soldiers, with all their accoutrements, can scale a perfectly flat, perpendicular brick wall in a few moments, without a ladder—a gymnastic feat which we see scarcely equalled in a circus. The suggestions of this paper were excellent, and might well be heeded by the educators of America.

Dr. Wight, the Health Officer of Detroit, gave a sprightly account of the method which he pursued in the disinfection of the badly constructed sewers of his city, and claimed that an immediate and pronounced diminution of diphtheria and scarlet fever followed as a consequence on two occasions. He had the sewers flushed with a strong solution of copperas, which he bought by the ton. In the two hundred miles of sewers 275,000 pounds of the chemical were used. He then burned three tons of sulphur, suspending from the man-holes iron pails, each containing a quantity of brimstone and a small fire. The sulphurous acid gas which was evolved filled the sewers and penetrated the connected house-drains, and, by escaping into dwellings, led to the detection of many previously unsuspected defects in the plumbing arrangements.

Dr. Lee, Secretary of the Pennsylvania State Board of Health, gave an exhaustive history of the celebrated Plymouth epidemic of a year ago. He proved that it originated in a single case, the first patient having contracted typhoid fever in a certain house in Philadelphia, whose surroundings were of the worst description. The patient went to Plymouth, where he was sick a number of weeks. His excrements were thrown out upon the snow near the house, and, when the snow melted, it flowed with its load of poison into a water-course which supplied the people in the town below with drinking water. 1,153 cases of typhoid fever resulted from this cause, and 114 of the patients died. Dr. Lee had an investigation made of the actual money outlay of every case; and, reckoning the expenses of medical attendance and nursing, the loss of earnings of the patients, and the capital represented by the producers who perished, the total cost of the epidemic was $711,104.25. Ten minutes of wisely applied labor a day, during the first patient's illness, and fifty cents' worth of disinfectants would have prevented all this loss of money, and all the suffering and grief entailed by the epidemic. A more wanton waste of treasure and life and happiness can hardly be imagined; for not one of these cases of fever would have occurred after the first, if the dejections of that one man had been disinfected, as recommended in the circular on typhoid fever issued by this Board. But even this ill wind blew some good; for the dreadful calamity of this country community awakened the Legislature of Pennsylvania to a sense of its responsibility, and it forthwith proceeded to establish a State Board of Health, which is actively at work, and, if decently supported, will do very much to make another such outbreak impossible.

Dr. Rauch, Secretary of the State Board of Health of Illinois, presented a complete report of the maratime quarantine from the St. Lawrence to the Rio Grande, detailing the rules at each port, the facilities for quarantine inspection and disinfection, and the degree of efficiency of the methods in force. No abstract can give an adequate idea of a paper dealing with minutiæ which vary so essentially in different places. It showed that there is great need of radical change in the quarantine arrangements of many ports, and in none more than in those of our own State.

Dr. Holt, President of the Louisiana State Board of Health, spoke of the measures taken for the sanitary protection of New Orleans,—municipal and maritime. He particularly urged the necessity of the appointment by Congress of a commission to investigate the alleged discovery by biologists in Brazil and Mexico of a method of preventing yellow fever by inoculation. If it should be found that this dread disease can be warded off in the way mentioned, the discovery will rank with that of the immortal Jenner, to whom we are indebted for vaccination.

Prof. D. A. Sargent, M. D., of Harvard College, presented the report of the Committee on School Hygiene. He argued for a proportionate distribution of mental and physical exercises in school life. Children ought to be taught the elements of hygiene, and shown how the principles may be put into practice.

Dr. Morris, of Baltimore, submitted the report of the committee on the disposal of the dead. He took strong ground for cremation as a substitute for burial. The practice of burning dead bodies is growing in favor in various European countries, where the need of it is more apparent than in America, on account of the more crowded condition of their population; but the arguments for cremation are receiving fresh support every year on this side of the Atlantic, as we learn more of the contamination of earth, and air, and water, by the products of the decomposition of corpses. The germs of certain zymotic diseases retain their vitality for a long time, and thus the body of a person dead of one of them may poison those who have survived him for years. The community would undoubtedly be safer, if all the victims of cholera, small-pox, scarlet fever, and diphtheria were burned, instead of buried.

The committee on disinfectants presented its report in the shape of a large, printed pamphlet, containing a description of the elaborate and costly experiments made during the last year on the relative power of the various disinfectants, and a statement of the results thus far arrived at. The distinction is drawn very sharply between deodorizers, antiseptics, and disinfectants. The first destroy foul smells; the second arrest putrefaction; the third destroy the germs of infectious diseases. Mere antiseptics are not destructive of disease-germs, though all disinfectants will stop putrefactive decomposition. The antiseptics are useful for arresting putrefaction in privy vaults, etc., but true disinfectants will do this work and much more. Chloride of lime and corrosive sublimate stand at the head of the list of disinfectants. The former, however, is nearly worthless, if it has been kept a great while, for it loses strength from the moment of its manufacture; therefore, none but fresh chloride of lime should be used. The corrosive sublimate is very powerful; but, on account of its extremely poisonous character, it should be used with great care.

A feature of the meeting which attracted marked attention was the awarding of the prizes for the best popular essays on four specified hygienic subjects. These prizes amounted to $2,800, and were offered by Mr. Henry Lomb, of Rochester, N. Y., a gentleman of only moderate means, but thoroughly persuaded of the importance to the common people of a knowledge of sanitary laws. The essays were entitled "Healthy Homes and Foods for the Working Classes;" "The Sanitary Conditions and Necessities of School-Houses and School Life;" "Disinfectants and Individual Prophylaxis against Infectious Diseases;" and "The Preventable Causes of Diseases, Injuries and Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding Them," Practical topics, on which every workingman ought to have some definite information. Cheap and popular editions of the successful essays are to be published and given the widest possible distribution, in order that their teachings may reach the classes for whose benefit they were written. Mr. Lomb's action is an evidence of a most generous spirit and an enlightened desire to benefit the people; and it deserves universal and grateful recognition, and frequent imitation.

A very pleasant incident of the occasion was the receipt of an autograph letter from the President of the United States, which is so encouraging, as the voluntary and cordial expression of appreciation from the Chief Magistrate of the Union, that it is here presented in full.

EXECUTIVE MANSION,
WASHINGTON, December 7, 1885.

DR. J. M. TONER:

My Dear Sir:—I am sorry that the condition of public business is such that I cannot accept the invitation which you kindly tendered me on behalf of the American Public Health Association, to attend its annual meeting to-morrow evening.

I beg to assure you that my expression of regret is not merely formal, but actually indicates a sense of deprivation which attends an inability to give by my presence, as requested, the fullest endorsement of the objects and purposes as well as the work of the association.

Surely the advancement of sanitary science and its practical application to the public health are of immense importance to the people of our land. Of course, the value of efforts in the direction of a better understanding of the causes of disease, and protection against the same, is too palpable for suggestion or argument. But I do not think the advantages of an improvement in the condition and sanitary surroundings of the homes of our workingmen, and of the poor among us, are sufficiently appreciated. Healthful and comfortable habitations indicate the best features of a country's prosperity and advancement, and men with good health and wholesome surroundings are apt to be contented and useful citizens.

The difference in the death-rate of cities and localities, unexplained by natural and inherent causes, is of itself enough to give great prominence to the work of the association, and if this beneficent organization shall succeed, as it ought, in impressing upon municipalities the duty of sensible and thorough sewerage, a plentiful and pure supply of water, and general cleanliness, together with a proper construction of school buildings for the children of their citizens, it may well point with pride to its achievements.

With the hope that the association may be the means of constantly increasing benefit to the country, and with expressions of heartiest sympathy with its work,

I am yours sincerely,

GROVER CLEVELAND.

On the days of the association meeting, there was held a conference of State boards of health. Twenty-six States were represented, Maine and Pennsylvania falling into line for the first time. The subject which received most discussion was federal legislation; but the ideas of the various members were so decidedly at variance —some favoring a restoration of the former appropriation of the existing national Board, others wanting to have an entire reconstruction of the Board, and still others determined that what is needed is not a board, but a bureau—that no definite decision was reached. Since this meeting, however, a committee has agreed upon a bill to establish a national bureau of health, and the measure has a fair prospect of passing through Congress. A committee was appointed to report next year on methods of mutual assistance, and it is expected that most of the Boards will, without a formal agreement, immediately institute a system of inter-state notification of contagious diseases.

The next meeting of the association and conference will be held in Toronto, Province of Ontario, Canada, on the first Tuesday in October, 1886.

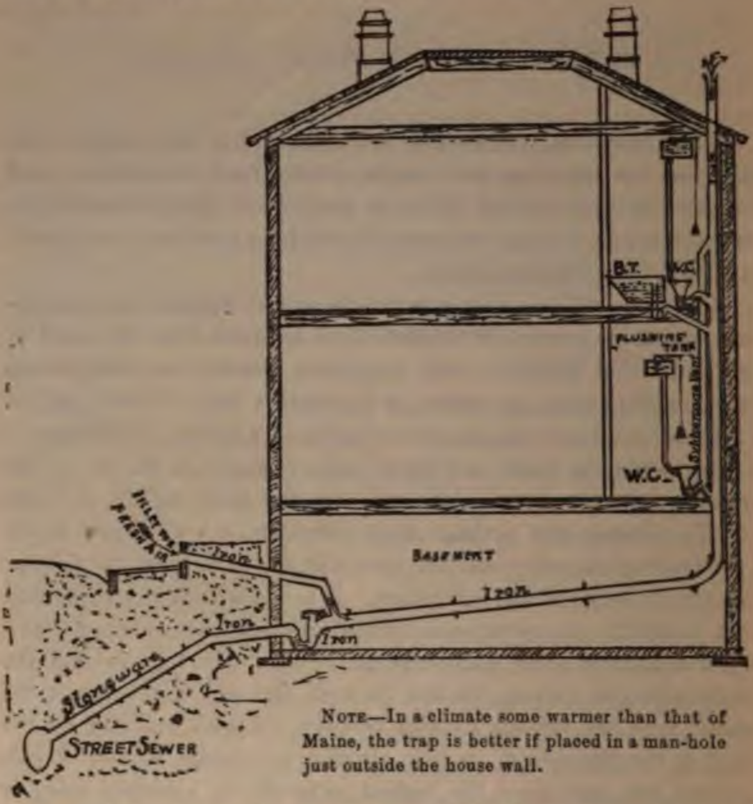
INCREASE OR DECREASE OF DEATH RATES,

AS SHOWING THE VALUE OF ENFORCING PLUMBING LAWS AND THOROUGH SYSTEMS OF SEWERAGE.

By E. C. JORDAN, C. E., Member of the Board.

Taking into consideration the amount that has been written and said, and the appalling evil results arising from carelessness and blunders, it is astonishing that even the general public should fail to comprehend the leading fundamental principles necessary in properly plumbing and draining a house.

Most cities recognize these principles and ordinances, and plumbing regulations protect the public in such localities from the result of the errors that ignorance and negligence combine to bring about. Without discussing the merits of the various traps or bars against the escape of sewer gas, or the necessity of avoiding syphonage, *i. e.* preventing the water seal from being removed in the use of the same or adjacent fixtures draining into the same outfall (a result equally common and perhaps more dangerous), I will begin at the very basis of the case—the soil pipe that serves to carry the sewage beyond the walls of the habitation. It is fundamental in sanitation that it shall be of coated or enamelled cast iron, with joints gas and water tight, and start from a point, at least, five feet beyond the house wall and extend full size through and out of the top of the house, with the various fixtures properly trapped, entering on the slant in the direction of its fall. It does not permit the use of galvanized iron pipe above the highest water-closet, a method more or less common in the few extensions through the roof in our State. It does not permit the use of a chimney flue separate or conjointly, heated or cold except that the same cast-iron pipe is continued through the flue and out the top, and, even this, under numerous restrictions. In the largest city of our State, Portland, in how many houses is even this first principle carried out? I doubt if there are ten. It is one of the essentials, and the neglect of it is indictable in those cities where they have adopted the modern plumbing regulations. The question of a trap on the house sewer against the street sewer is somewhat mooted, but the opinion largely prevails in its favor, supplemented with a fresh air inlet that serves to make a fairly constant current into the soil pipe near the foot wall of the house and through and out of the top. The following diagram illustrates the principles and methods above indicated.



NOTE—In a climate some warmer than that of Maine, the trap is better if placed in a man-hole just outside the house wall.

It was but a few weeks ago that considerable excitement existed in regard to the prevalence of diphtheria on Munjoy Hill, Portland, Maine. It was, and I think fairly, attributed to the bad sanitary condition of the school-house there located. The city closed the school and ordered the house put in good condition, and the expense, evidently, was not counted. A mason, and a good mason, was employed, and charged to do the work well, and it was thoroughly done according to the best of his knowledge. This is the result: A six or eight-inch stone-ware running trap was set into or under the foundation wall of the building, without an arch over it, (the former trouble, I was told by the mason was largely traceable to a broken (settled) trap under one of the school sinks). Well jointed, first-class iron soil pipe with fresh air inlet brought through the wall, runs from the trap for a distance of sixty feet under the floor, receiving the various trapped fixtures right and left, and ends in the central flue of a three-flue chimney. To prevent the forcing of the main trap under the wall by sewer gas ascending the hill, the street sewer was vented by connecting with it an iron pipe starting just outside the wall of the house, passing through the wall and across the cellar about twenty feet, and ending in the central flue of another chimney. The flues either side of the one in which this pipe was entered, are pierced with ventilating holes for the various school-rooms through which the chimneys pass. This is the scheme that the public were invited by card in the newspapers to admire, and it was admired by apparently the whole supervising School Board and Committee. The work perhaps improved the former condition of the building, but I wish to explain what would and should have been avoided by submitting such plans to a board of inspectors acquainted with even the primers of sanitary literature.

In the first place, the earthen-ware or cement trap is liable to be broken by the slightest settling of the building, and should be differently placed; and secondly, the ventilating of the street sewers of that vicinity (a very good thing to do by carrying the pipe on the outside of the house to its top) into a leaky chimney flue with adjacent flues open to the school-rooms is a proceeding fraught with danger. The use of a chimney flue, even if heated, which those spoken of are not, has so often proved bad and been condemned, that it is surprising that it should find approval in our midst. The fact that chimney flues, even when new are far from gas tight, and the by-no-means infrequent occasion of a downward draught, has made, and will continue to make, such a scheme wholly disastrous. I have cited the above case, because it is recent, and because it belongs to the public. I could cite cases of defective plumbing where the illness and death brought about in consequence would make hanging seem a just punishment for the men who botched the work.

To give a less serious instance. In 1873, A. moved into a house that had just been plumbed with the then modern conveniences. Gradually it dawned upon him that the illness in his household might have a cause in his own kitchen. He traced the concealed 4-inch soil pipe to a point below the kitchen floor (there was no cellar under the L), where he found it entered a 6-inch cement pipe standing on top of a 12-inch brick drain leading to the street sewer. There was no trap on the drain, and its gas was pouring out through the space between the 4 and 6-inch pipes at a rate sufficient to saturate the kitchen at times. The plumber said it was the mason's duty to make the cement joint, and the mason blamed the plumber. A plumbing law, with inspector's services, would have prevented such an atrocity. About 10 years ago, the city of Croyden, England, was sewered in the most perfect manner, as was at the time supposed. An outbreak of diphtheria and other zymotic diseases followed, and to the surprise of every one it was confined to the houses of the wealthier classes, in the highest and finest parts of the city. It was found that the pressure of the sewer gas was greater there, and that in times of rain-fall the gas would be forced to the higher levels, and through the individual house traps. Relief immediately followed the placing of ventilating pipes upon the outside of a sufficient number of buildings to relieve the gas pressure. The case may not be inapplicable to the late trouble upon Munjoy Hill, Portland. In a city without regulations, plumbers come in for too large a share of blame for imperfect work. A contractor puts up a house, runs from the street sewer (or cess-pool in the country) a line of stone-ware or cement pipe, and in most cases across the house under the cement floor to its rear. At this stage the various plumbers are interviewed, and as there is no legal standard of work, the lowest bidders get the job, and depend upon it, it is made to yield a profit. It is this class of work that desolates our homes. The Government requires the work of boiler makers to be inspected, to see if the boilers can safely do the work assigned them. It should be the same with that of plumbers. No city in Maine is large enough to support the plumber, who, in competition, figures the cost of work upon the standard now demanded in cities where regulations exist. The landlord should be required to furnish his tenant with a plan and certificate of inspection.

Many not unimportant details arrive each year at a greater degree of excellence, which makes it somewhat difficult to fix upon a standard, but the advance made by requiring fundamental matters to be passed upon by a properly constituted board is too great to be neglected, on the ground that certain details have not been fully perfected.

Experience is bringing to light so many defects in various sewerage systems, and the discussion of them is so constantly placed before our eyes at this date through the great medium of the press, that it occasions a certain degree of skepticism about sanitary reforms in the minds of not a few unthinking people who neglect to apply the rule of progress to sanitation, where they readily accord it to other sciences; and from such people little aid is to be derived in the prosecution of sanitary work. In fact it is rare that pressingly needed public work escapes their direct opposition. The demonstration of certain facts is becoming so easy by the accumulation of statistics bearing upon the experiences of cities and towns in our own midst, that it seems incredible that opposition to the economy and money value of certain rules in sewerage can exist much longer.

A graphic illustration of how closely the death-rate in our cities corresponds to the method of drainage and sewerage peculiar to each street and section may be represented as follows: A plan of the city showing all its houses is used on which the location is plotted where occurs each death that results from what is known as a preventable disease, such as typhoid and scarlet fevers, diphtheria, &c. &c., which are given, let us say, on the map, the colors of red, blue and green. These colors are dotted upon the buildings where such diseases have prevailed. It requires but a few years of these records to place the danger signals on the places where they belong. Upon a map so kept in New York City a prominent line of danger signals was noted following a somewhat erratic curving course, crossing the streets mostly at right angles, and extending for some distance through the better part of the city. The reasons for it were not apparent, but a little research upon ancient maps developed the fact that through this vicinity, now graded and filled to a uniform surface, a narrow ravine once existed where a brook fed by numerous springs had meandered. The underground water course still existed more or less interrupted and dammed back by the streets, and more or less polluted by the leaky sewers that crossed it.

Such a polluted source of damp foundations to the residences along this line was an ample explanation of the case, and points out the necessity of a city's never neglecting in its growth to provide for the free and certain escape of spring water in similar localities. Such a map in the city of Rochester was even more specific. The danger signals or their absences there indicated the very variety and style of the sewer used. It showed the excellence of the tightly-jointed pipe sewer, and the necessity on nearly level areas of having them not only tight, but carefully proportioned to bring about the greatest velocity possible in the carriage of the sewage as a preventive to the formation of gases. It pointed out the streets in which the open-jointed stone or brick sewers existed, the streets through which old water courses ran, now walled up and turned into sewers; the house improperly connected with the sewer, the skin plumbing, the leeching privy vault. All these things such a map will do. In Maine it would point out the polluted wells and water supply in our country towns and villages, the sink spouts whose contents are discharged close to the foundation of the house, and indirectly, the poorly-ventilated school-houses and public halls. By the aid of such a map we should perceive the necessity of an intercepting sewer at Portland, Maine, and the venting against the sewer gas on Munjoy Hill, in the same city; just as in the case of the trunk sewer at Toronto, Canada, and the venting of sewers on Croyden Hill, England. One might at first think that it would make a picture of a land unfit to live upon, or raise the question of why do we try to live at all? But no, a second look will show, as I have stated before, that there is a direct ratio between the death-rate and the degree of excellence of a system of sewerage and enforcement of plumbing ordinances.

Chicago's sanitary reforms and public works have lowered her death rate 43 per cent, *i. e.* from 37.91 deaths per thousand to 21.4, and I have before me at present writing, a list of over a dozen towns where the inauguration of systems of sewerage reduced the former average of death over 21 per cent.

To change the picture from its unsightliness requires the skilled hand of a master, but as in early times the Jesuit Fathers held before the eyes of the Aborigines, pictures of the torments of Hell meeted out to the unconverted, so would I have every town keep a graphic representation of its filth, so that if it must learn the lesson by bitter experience, it may know where the first dollars in remedy may best be expended.

The ounce of prevention seems the veriest mite when we compare it with the cost of the pound that cures the epidemic.

VACCINATION.

By O. A. HORR, M. D., Member of the Board.

In this discussion of the subject of vaccination our aim is to outline and bring to the notice and attention of the public some of the more important facts established by the study, observation and experience of many of the most eminent men in sanitary science, and confirmed by the further observation of nearly the whole of the medical profession throughout the civilized countries of the world for more than three-fourths of a century, relating to the suppression and prevention of small-pox, which previous to the discovery of vaccination was the greatest of all the world's destroyers of human life and health.

Our reason for this is not in the hope or thought that any new truth may be brought to light, but that the important truths already demonstrated and confirmed by overwhelming testimony, touching the matter of vaccination, may be extended and better appreciated by the masses of our people. For, notwithstanding the present common practice of vaccinating, there still remains in the minds of a large per cent. of the people an indifference and a prejudice, generally the results of ignorance, that in all times and in nearly all communities harbors and maintains an element of danger to life, health and the business interests of the State, that is almost wholly preventable and unnecessary. An indifference and prejudice that may at any time in the future, as it has already many times done in the past, bring a most loathsome disease, not only to the negligent and prejudiced, but to innocent children and to whoever may be unprotected, with the probability of loss of life, it may be of a single person, or it may be many, in communities near and far, as has recently been the case in Canada and the Province of Quebec.

In order to more fully appreciate what vaccination is, what it has done, and what it may reasonably be expected to accomplish when its just claims shall everywhere be fully appreciated and its best possible results attained, it may not be unprofitable or out of place to consider briefly in this connection a few points in the history of "*Small-Pox.*"

Of the origin of small-pox, as of many other diseases, little is definitely known. There is no evidence that it was known among the Greeks or the Romans. It is also certain that it is not indigenous in Europe or the American continent; while from Pagan history and traditions it appears to have prevailed in India and China from time immemorial, where it seems not unlikely it had its origin.

The earlier accounts are vague and uncertain; a fact that should not seem strange when it is considered in what a maze of superstition and blind tradition the whole matter of disease and therapeutics was then shrouded. It appears quite certain, however, that it prevailed in Arabia about the time of the birth of Mahommed, in the latter part of the sixth century, and that it spread thence into Syria, Egypt, and Southern Europe with the advance of the invading armies of Mahommed's successors, to be scattered more broadcast through the generations that followed by the almost countless pilgrimages to Jerusalem, during the long period of the crusades, after which it prevailed in many, especially of the temperate, countries of Europe, though it does not appear to have reached Germany and Sweden till near the close of the fifteenth century, and some of the more northern countries, as Norway and Lapland, till the early part of the sixteenth century. In England it had gained an entrance as early as 1241–42. Soon after the discovery of America, in 1517 it was imported from Europe into St. Domingo, and in 1527 it had reached Mexico, and soon extended northward to the tribes of North America with intense violence. It reached Iceland in 1707 and Greenland in 1733, since which, with the rapid development of commerce, it has spread to nearly every, if not every, inhabited country of the globe and almost every island of the sea. The reason for much of the obscurity pertaining to its early history may be the better comprehended when we recall the fact that for centuries small-pox was confounded with plague and nearly all the papular and pustular eruptions, also with syphilis and with measles, even down to the time of Seydenham.

Of its ravages and life-destroying effects before the discovery of vaccination, and since, when that protection has not been afforded, a few of the many instances that might be stated would seem to suffice to show that the human race of to-day, without the protective power and influence of vaccination, would experience in small-pox a foe more deadly and more to be dreaded, because more torturing and more destructive, than war and famine, or the plague as it raged in the history of the past, or cholera or yellow fever or any other disease or malady to which human flesh is heir; for while these may have been in the past and some are at present direful, they have been mainly local in their field of action, but small-pox uncontrolled by the prophylaxis, vaccination, knows no climatic boundary. It spreads onward and forwards wherever travel and commerce leads the way, whether under the scorching rays of the sun at the equator, in the milder climate of the temperate zones or in the icy regions of the North. It is pandemic.

Quoting from Transactions American Public Health Association, 1883, we are informed by a high authority, M. de LaCondomine, that "before vaccination small-pox was the cause of one-tenth of all the deaths among mankind. Among those who outlive it many either totally or partially loose their sight or hearing, many are left consumptive, weakly, sickly or maimed, many are disfigured by horrid scars and become shocking objects to those who approach them."

Within a few years after the first appearance of the disease in Mexico, in the early half of the sixteenth century, over three million five hundred thousand of its inhabitants had died of this disease alone. In 1653 it invaded Brazil, and in places nearly depopulated whole sections of country.

The Province of Quito, in a few years, lost one hundred thousand of her population. In 1707, at the first invasion, Iceland lost eighteen thousand lives out of a population of fifty thousand, or nearly two-fifths of its inhabitants, and Greenland, in 1834, lost more than two-fifths of its entire population. Siberia has had an experience nearly as saddening; even Kamschatka has been terribly visited. Europe, in the century preceding the discovery of vaccination, is said to have lost by small-pox fifty million of her population, a number nearly equal to the entire population of the United States at present time.

In this country the native Indians have been terribly visited, in numerous instances nearly whole tribes being swept away. In Catlin's lectures and notes on the "Manners, Customs, and Conditions of the American Indians," we read that "Thirty millions of white men are now scuffling for the goods and luxuries of life over the bones and ashes of twelve millions of red men, six millions of whom have fallen victims to the *small-pox*, and the remainder to *the sword, the bayonet, or whiskey*." Washington Irving in "Astoria" makes mention of several outbreaks in which almost entire tribes have perished.

From Earnest Heart's paper, "The Truth about Vaccination," (London, 1880,) the following is gleaned: that in England, before vaccination, "in the London Bills of Mortality, small-pox, when not at its worst, averaged a fourteenth of the annual deaths, and that, too, when the total death-rate was about double the present death-rate.

"Nearly one-tenth part of all the persons who died in London within the Bills of Mortality during the last half of the last century, died of this one cause. The younger part of the population were peculiarly its victims; in some of our great cities it was found that, on an average of long series of years, nearly, or more than one-third of all the deaths which took place in children under two years of age, arose from small-pox."

In America, statistics are largely wanting to show the per cent. of mortality from small-pox, especially in prevaccination times, yet enough is known to justify the conclusion that the experience here did not differ, materially, from that of England.

In France, Germany and the other countries of Europe, a like ratio of mortality was recorded, and a like amount of impairment of health and disfigurement of features were also noted. No rank of society however exalted in official or social position, and however favored by sanitary guardianship, escaped its deadly shafts. William the Third, himself, suffered from it most severely, and escaped death only to suffer the infirmities of a constitution impaired for life, while his father and mother, and wife, and uncle (the Duke of Gloucester), and two cousins, son and daughter of James the Second, died of it. In the court of Austria, Joseph the First likewise fell a victim; and besides him, in the course of the eighteenth century, two empresses, six arch-dukes and arch-duchesses, an elector of Saxony, and also an elector of Bavaria, fell in like manner a prey to this terrible destroyer.

To this dark page in the list of royalty may be added a dauphin of France in 1711, a king of France in 1774, a queen of Sweden in 1741, and an emperor of Russia in 1727. Thus from the records of the three last centuries could be gathered an almost unlimited amount of evidence all tending to show that prior to the discovery of vaccination by Jenner, mankind had no other foe so life-destroying and relentless as small-pox. Macauley has justly said of it, in referring to its ravages near the close of the seventeenth century, in comparison with those of the plague, that "it is the most terrible of all the ministers of death. The havoc of the plague had been far more rapid, but the plague had visited our shores only once or twice within living memory. The small-pox was always present, filling the church-yards with corpses, leaving in those whose lives it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to the lover." But we have followed this sickening record sufficiently.

With a few preliminary explanations, now that nearly ninety years have elapsed, we will proceed to consider:—

How vaccination originated;

What it has accomplished;

How it can be made most salutary and protective to the individual and the State, and

The technics of vaccination.

PRELIMINARY EXPLANATIONS.

As preliminary to a consideration of these several topics in view of the fact that there has always existed in the popular mind, (for whose benefit these pages are principally written,) no little amount of confusion and lack of understanding of names and terms used by writers, we will endeavor to explain a few such, in order to make more plain our subject, but without any claim to full or perfect definitions. *Variola* and *Small-pox* are but different names for the same disease.

Varioloid is "a form of *small-pox* with a milder course and shorter duration" (Ziemssen). It is sometimes spoken of as modified small-pox, from the fact that when the disease occurs in persons whose systems have been influenced by vaccination, it is generally in the mild or modified form. It may, however, occur in persons but moderately susceptible to the small-pox contagion, whose systems have never been influenced by vaccination. Such modified small-pox or varioloid cases are not the rule, but are rather the exception in unvaccinated persons contracting the contagion, while among those well vaccinated who contract the contagion varioloid is found to be the ordinary result, and not the fully developed small-pox.

Of the terms cow-pox, horse-pox, sheep-pox, &c., it may suffice to state that for generations in various parts of the world a disease has appeared among these and other animals manifesting itself in various degrees of severity, having in sheep in numerous instances proved very fatal, while in cattle and horses it has generally been of a mild type, which has been characterized by the development of an eruption on some portion of the surface of the body which very closely resembles the eruption of small-pox in man, and by being communicable by contagion from one animal to another of the same kind, but which is not known to be communicable to man except by the method of what is known as vaccination, equination, &c., according as the disease is introduced into the human system by inserting the matter (properly speaking the lymph) obtained from the points of eruption of the one or the other of these animals into some part of the human body through a cut, scratch or abrasion of the skin or mucous membranes.

Of the terms *inoculation* and *vaccination*, it is only necessary to say, in explanation, that inoculation strictly signifies the communication of a disease by the insertion of infectious matter in the skin or flesh; thus to inoculate a person with small-pox is to communicate to him small-pox by inserting, in his skin or flesh, virus obtained from a person having small-pox.

The term vaccination, (derived from the Latin *vacca*, a cow) signifies to introduce into the animal system, whether man or brute, through the skin, the lymph or virus obtained directly or indirectly from the vesicle on the skin of the cow having cow-pox.

Virus obtained directly from the cow is commonly called *bovine virus*, sometimes also *animal virus*, while that obtained from a person who has been vaccinated with the virus obtained from the cow, whether directly or whether it has been transmitted repeatedly from one person to another, is frequently spoken of as *humanized virus*.

As a further apology for these definitions we desire to state that we have found among people of fair intelligence in common matters, not only great ignorance, but very extravagant notions concerning the principles and methods of protection against small-pox. As an illustration, a person came to us for vaccination sometime since, with the inquiry, "Can't you vaccinate me with some kind of medicine that will answer the purpose just as well?" Another, a finely-attired lady, came, bringing a little child to be vaccinated, but begged us not to vaccinate her with calomel.

HOW VACCINATION ORIGINATED.

An eminent American authority has recently said that "Up to the last one hundred and fifty years it (small-pox) was the most frequent, the most fatal and the most injudiciously treated, of all the pestilences that have afflicted mankind. Notwithstanding the accumulated experience of practice, the medical profession, during all that time, had discovered neither preventive nor cure, remaining a sad spectator of its desolations, and utterly unable to afford relief. It defied alike the measures devised by civil rulers, and the appliances of medical science, continuing for ages unimpeded in its work of death and disfigurement."

It is claimed that the Chinese for many centuries were wont to convey small-pox from one person to another by putting the crusts obtained from the bodies of small-pox cases in the nostrils of persons who had never had the disease. This practice seems to have been, in part at least, from a superstitious belief that the favor of their Gods was thereby secured, and that the persons so infected were thus specially exempt from the greater violence of the disease.

A similar practice is said to have prevailed among the Brahmins in India, time out of mind, consisting in the true engrafting of small-pox from one person to another. Whatever the truth may be in respect of these traditions, it is known of certainty that the Turks in the early part of the eighteenth century had come to practise the inoculation of small-pox as a method for mitigating the disease, though the practice attracted little or no attention abroad, till the writing of the famous letter on the subject by Lady Mary Worthly Montagu, a person of distinction, who was temporarily residing in Adrianople in 1717. In that letter she says: (Chambers' Encyclopedia) "'The small-pox, so fatal and so general amongst us, is here entirely harmless, by the invention of *engrafting*, which is the term they give it. Every year thousands undergo the operation. There is no example of any one who has died of it, and you may believe that I am well satisfied of the safety of this experiment, since I intend to try it on my dear little son'. Four years afterwards she had her daughter publicly inoculated in this country (England); the experiment was then performed successfully on six condemned criminals at Newgate, and on the strength of these successful cases, the critical course was taken of inoculating two children of Caroline, Princess of Wales, which gave a sanction to the practice." Thus the practice of inoculation came to be quite common in England.

In the same year of its introduction in England, it also attracted the attention of a few American physicians, and large numbers of persons in Boston were inoculated by Ward Nichols Boylston, who first noted the fact that small-pox produced by inoculation had a shorter period of incubation than when contracted in the ordinary or natural way, and hence, that a person after known exposure may anticipate the natural development in the severe form, by inoculation, with the probability of substituting the mild form. The claims made for inoculation were that the resulting small-pox was characterized, generally, by a small amount of eruption, the pocks or pustules rarely exceeding one hundred; that the secondary fever was absent or very slight; that little constitutional disturbance was caused, and that no marked pitting resulted. The rate of mortality was found to be very greatly reduced in any given number of cases of inoculated small-pox as compared with an equal number of cases contracted in the natural way. Whereas, small-pox in the broad average had proved fatal at different times and places, according to the virulence of particular epidemics, in from one-third (in some instances even a greater ratio) to one-fifth of all the cases as ordinarily contracted, inoculated small-pox proved fatal in not more than from three to thirty in every thousand cases. [Flint.]

The protection against subsequent attacks of small-pox was found to be as great by inoculation as by the disease when contracted in the ordinary way.

In France inoculation was not introduced for many years after the practice was established in England and America. At the close of the eighteenth century it seems to have been known and practised in many parts of the world, and to have been held by different experimenters as well as by different communities in different degrees of estimation. That it mitigated the severity of the disease very greatly, there was no question; but as the virus inoculated was small-pox, so was the disease produced with all the power of infecting others, so that each inocculated case at once became a new focus from which could spread the disease in all its wonted severity.

Thus, at the close of the eighteenth century, after a recorded experience of three-fourths of a century with inoculation, which at first had given promise of deliverance from the world's greatest scourge, it was found that although by its means the disease was shorn of its greatest dangers to the individual, it was also sown more and more broadcast, and that the rate of mortality from it had actually been increased.

It is but just, however, that acknowledgment should be made that in the conception of inoculation was a germ that, taking root in a fertile mind, developed into that grander conception, which, spurning the discouragements of blighting jeers, and criticism, and scorn, and reproach, and even cruel persecution, has ripened into a harvest whose fruitage marks it as the grandest achievement in the domain of medical science.

There is abundant proof that for several centuries cattle and horses have in some parts of the world, at times, been affected with a disease having some of the characteristics of small-pox in man. It is said to have been first observed in England in 1745. [Aitken.] It again appeared in 1770, and with so much severity that His Majesty, George III, in his speech from the throne, called upon Parliament to take the matter into serious consideration. The disease continued till 1780. During this decade commenced a series of observations which, continuing through a period of more than twenty years, led to the announcement of the discovery of vaccination, as a prevention of small-pox, by the justly world-renowned Jenner, in 1798.

Edward Jenner was born at Berkeley in Gloucestershire, England, in May, 1749, and was the son of Rev. Stephen Jenner. While a youth, having completed his preparatory course of study, he removed to Sodbury, to receive instruction in surgery and pharmacy by Mr. Ludlow, an eminent surgeon of that place. While here a circumstance occurred, seemingly trivial, but which is said to have suggested the thought, which gradually deepened and expanded by inductive reasoning, led to that discovery which has crowned the name of Jenner with imperishable honor, as of mankind, the greatest benefactor of man.

While he was pursuing his studies with his preceptor at Sodbury, a young woman came to the house for professional advice. The subject of small-pox having been alluded to, she remarked "I cannot take that disease, I have had cow-pox." This remark seems to have made a lasting impression on the mind of young Jenner, who was then less than twenty-one years of age, tho' his more eventful observations were not earnestly commenced till several years later, during which, having completed his course of study with Mr. Ludlow, he had further pursued his professional studies two years in London with the celebrated John Hunter, in whose family he resided. Having returned to Gloucestershire and settled in practice in Berkeley, he commenced, in 1775, his investigations of the natural history of cow-pox (*vaccinia*) and the relations of this to the kindred diseases affecting other of the lower animals and to small-pox in man.

The great epizoötic of cow-pox that had commenced its spread in various parts of England in 1770 had scarcely expired in Gloucestershire at this time. It had for a long period of time been known that persons employed in the care of horses and cattle had sometimes contracted sores, especially about the hands, from the heels of horses having "the grease" (horse-pox) and from the udders of cows having vaccinia (cow-pox). There was a tradition, popular among such persons, that any one having such sores would not contract small-pox. The lady who had visited the house of Jenner's preceptor had imbibed a belief in the truth of this tradition. There appears no evidence that scientific men shared in the least in this belief or investigated its claims.

As a result of his observation, Jenner soon became more and more deeply impressed with the importance of the subject of his investigation.

He found the origin of small-pox to be ancient and obscure, so likewise that of cow-pox and the kindred disease in other animals; certain characteristics in the eruption of the skin were common to all; first pupular then vesicular, afterwards the formation of crusts or scabs. Small-pox was contagious among people, the same was true with cow-pox among cattle, tho' in degree much less so; one attack in man was, as a rule, protective against subsequent attacks, the same was true in the lower animals; small-pox had been transmitted from man to man by inoculation as a somewhat common practice for half a century, with the effect of producing the disease in a milder form. A similar practice had recently been adopted in respect to cow-pox, with similar results; the inoculated disease in either case was equally protective with that contracted by the ordinary mode of contagion. The seasons of greatest prevalence of small-pox were frequently, but with many exceptions, characterized by the prevalence among cattle of cow-pox; both were subject to great epidemic tendencies, but frequently prevailed somewhat sporadically. Small-pox was a very fatal disease among people, while cow-pox was generally a mild disease among cattle. Tho' believed by many able observers to be communicable by contagion from animal to man and from man to animal, neither was to be the case.

Such ground work constituted at least a part of the foundation on which to erect a new and lasting monument to scientific research.

Thus Jenner set himself to the work of investigating the most minute particulars relating to the various phenomena of the diseases as they appeared in man and the lower animals, from which he arrived at the conclusion that they had a common origin (a conclusion concerning which there has been a very great amount of controversy, and which can scarcely be considered as settled, even at the present time); and that the popular tradition of dairymen, concerning protection against small-pox among persons having had cow-pox from the contact of abraded surfaces about the hands or other parts of the body, with the udders of cows or the heels of horses having the disease was true. He concluded that the disease as found in the cow was communicated by the hands of persons in charge of horses having grease. In short, he concluded the disease as found in cattle, horses, sheep, swine, dogs and other animals were identical with small-pox in man, varying only with the difference in the animals affected. It is related of him that as early as 1780, that while in company with a friend, "he went over the natural history of cow-pox; stated his opinion as to the origin of this affection from the heel of the horse; specified the different sorts of disease which attacked the milkers when they handled infected cows; dwelt upon that variety which afforded protection against small-pox; and, with deep and anxious emotion, mentioned his hope of being able to propagate that variety from one human being to another, till he had dissiminated the practice all over the globe to the total extinction of small-pox. [*Baron's Life of Jenner.*]

That hope remained an inspiration in his mind which no discouragements could blight; many investigations were to be made with the most pains-taking care and with the most rigid and unbiased interpretation of their results. He found that persons had contracted other than the vaccine disease from cattle and horses, which led him to a more critical inquiry into diseases affecting animals. Here he found that other than *vaccinia* and *grease* sometime scaused eruptions about the teats and udders of cows and the heels of horses. Some of the persons who claimed to have had sores about the hands, contracted from animals, had subsequently had small-pox. As in the early history of small-pox it was confounded in the mind with several other diseases, so now in the case of vaccine disease. Thus one obstacle after another was encountered, with little or no encouragement from men of science, till twenty years of unabating study and toil had passed away, when the many perplexing questions had been so well considered and settled, that hope had given place to conviction, and faith to assurance. And such was his assurance, that on the fourteenth day of May, 1796, he put his theory to public test. "On that day matter was taken from the hand of Mary Nelmes, who had been infected by her master's cows, and inserted by two incisions into the arms of James Phipps, a healthy boy of about eight years old.

He went through the disease, apparently, in a regular and satisfactory manner; but the most agitating part of the trial still remained to be performed. It was needful to ascertain whether he was secure from the contagion of small-pox. This point, so full of anxiety to Dr. Jenner, was fairly put to issue on the first of the following July. Variolous matter, immediately taken from a pustule of a small-pox patient, was carefully inserted by several incisions, but no small-pox followed." His long-cherished hope was for the first time realized. It still remained to show to the world how great a boon was in store for humanity. But men were slow to accept the new doctrine. As in the past his scheme had been ridiculed, so was now his avowed discovery, with added derision to the discoverer himself. Nothing daunted, however, he continued his experiments and investigations.

Two years later, in 1798, he prepared a report of his observations, fully convinced of their importance, and sent it to the Royal Society for publication, hoping it might be well received, but he was doomed to the further mortification of having it rejected. Still persevering, he published his memoir under the title "An Inquiry into the Cause and Effects of the Variolæ Vaccinæ," which, attracting the attention of physicians, soon gained the recognition of its merits. A year later, in 1799, so great an impression had been made that seventy of the leading physicians and surgeons of London signed a statement declaring entire confidence in the discovery.

At this time almost every person vaccinated was put to the rigid test of subsequent inoculation with virus direct from small-pox pustules; so that Jenner, writing in 1801, declares that "upwards of six thousand persons have now been inoculated with the virus of *cow-pox*, and far the greater part of them have since been inoculated with that of *small-pox* and exposed to its infection in every rational way that could be devised, without effect." Other testimony to the same effect was offered by other observers, all of which confirmed beyond question the claim of Jenner to the great prophylactic power of vaccination, tho' the complete efficiency claimed for it in its early history has not been fully realized in later years. A full consideration of the reasons assigned for the seeming decline in its protective power would lengthen this paper beyond proper limits, so that we will only say that while it is not improbable that Jenner's claims were somewhat overreaching (he taught that thorough vaccination was equally protective with an attack of small-pox itself), it is quite certain that the care and skill in the methods of vaccinating and the selection of virus have been far less than in the early days of the discovery.

It is a matter of record that while Jenner was a young man, before his eventful investigations had taken form, the operation of vaccination had been performed successfully, in Jenner's own country, by a farmer of Gloucestershire; and in a church-yard at Yetminster, in Dorsetshire, England, is a tombstone on which is inscribed: 'Sacred to the memory of Benjamin Jesty, who departed this life on the 16th day of April, 1816, aged 79 years. He was born at Yetminster, in this county, and was an upright, honest man, particularly noticed for having been the first person (known) who introduced cow-pox by inoculation; and who, from great strength of mind, made an experiment from the cow on his wife and two sons in the year 1774.' In 1805 he is said to have made good his claim as the first to perform the experiment before the medical officers of the original vaccine pock institution at London, and at the same time Mr. Robert Jesty willingly submitted publicly to inoculation for small-pox in the most vigorous manner, and Mr. Jesty was also subjected to the trial of inoculation for cow-pox after the most efficacious mode, without either of them being infected" (*Lancet, Sept. 13, 1862*). This circumstance well illustrates how nearly many of the most important discoveries have been antedated by others, and yet, from some lack, as of appreciation, have failed of completion. Jesty's experiment was a daring one, and pregnant with possible results, but does not, in the smallest degree, detract from the work of Jenner, or the honors due his name.

Vaccination, though meeting with the most strenuous opposition among all classes of people in private and in public, being frequently condemned, ridiculed and caricatured by the press, soon grew immensely in favor. Its practice rapidly spread over the principal towns and cities of England, and was in a few years promulgated throughout the civilized world. Jenner was the recipient of honors from foreign courts, and was elected honorary member of most of the learned societies throughout Europe.

In 1802, Parliament, after having appointed a committee to investigate the merits of his discovery, voted him a grant of ten thousand pounds, and again, in 1807, an additional grant of twenty thousand pounds. He died in 1823, and in 1858 a public statue was erected in his honor in London. But his grandest and most enduring monument is his work.

The origin and early history of vaccination, as recorded in the early part of this century, are of great interest, and their study will repay every student of science, and lover of its triumphs; but having so far glanced at the subject, let us briefly consider the question,

WHAT HAS VACCINATION ACCOMPLISHED?

For several years Jenner's claim that thorough and efficient vaccination was equally protective against small-pox, with an attack of that disease itself, appears to have been the experience of others as well as his own. Exceptional cases of persons having the disease (small-pox) two or more times were well known then as now, so in his view exceptional cases might occur where vaccination would fail of securing perfect protection.

"A committee of the House of Commons, appointed in 1802 to inquire respecting the merits of his discovery, for determining if he was deserving of a national reward, after hearing all that the enemies of vaccination had to say, could discover only two cases in which small-pox had occurred after vaccination had been properly performed. In 1806 the Medical Council of the Royal Jennerian Institute admitted the occurrence of post vaccinal small-pox, but declared it to be 'very rare' and 'generally so mild as to loose some of its characteristic marks, and even to render its existence doubtful.' In 1811 the National Vaccine Establishment carefully investigated and published an account of two cases in that year. They mentioned one of these as the severest that had yet occurred to them, and also reported that it was their belief that 'since the practice had been fully established, *no deaths* from small-pox had in any instance occurred after vaccination.' This was in 1811, thirteen years after vaccination was begun; and as yet no fatal case of post vaccinal small-pox known. Remember, too, that the exposure to its contagion was vastly greater than now, because it was always prevalent. After 1810 the practice had become very general in other countries and cities of Europe and the statistics were carefully recorded. They show a like exemption from small-pox after vaccination. In Copenhagen, then a city of over 100,000 inhabitants, where vaccination was universally practised, not a single death from small-pox was registered during the thirteen years from 1811 to 1825. In Anspach, in Bavaria, with a population of 300,000, at that time thoroughly vaccinated, no death occurred from small-pox during the nine years, 1810 to 1818. Between 1804 and 1813 more than two and a half million people were vaccinated in France and only seven individuals of those were known to have taken small-pox. It was not until vaccination had been practised fifteen or twenty years that post vaccinal small-pox became at all common or frequently fatal." [*Connecticut State Board of Health Report, 1882.*]

That vaccination, during its first decade, and for a period somewhat beyond, should have shown itself almost completely protective, and then gradually to have shown itself less protective against small-pox, is a matter about which our best authorities have held different opinions, and about which very much has been said and written; still, with all their difference of opinion as to the cause of this, all are agreed that, notwithstanding it has since failed in many instances of conferring complete security against small-pox infection, it does, as a rule, to which there are few exceptions, possess the power and have the effect to so far mitigate the disease as to render comparatively safe what would otherwise be one of the most fatal of diseases known to man; that a large per cent. of persons vaccinated are protected for life while the balance are in a greater or less degree, many entirely, for periods of time varying according to the different degrees of susceptibility of different individuals, and according to the quality of virus employed, the manner and extent of its employment, &c., also that to furnish the greatest possible degree of protection, the practice of re-vaccination, after considerable intervals of time, should be adopted, and when so adopted would secure universal protection as a rule of general application. But concerning the means and rules to be adopted for the most complete and successful results of vaccination, a few words will be said further on.

Had the conclusion of Jenner and his immediate followers, concerning the complete and lasting protection afforded by vaccination, been verified in later years as it was during the first few years of its use, all opposition and prejudice against it must have died, as it were, of starvation, for from the records it would seem that for a period of ten or more years, among the many tens of thousands vaccinated, cases of subsequent small-pox were as rare as the cases in whom small-pox occurred a second time, which was the full measure claimed for its protective effect.

But when it was found in after years that the number of persons having small-pox after vaccination, even though nearly always in a modified and mild form (varioloid), were gradually increasing in number, and that among such, fatal cases were known to occur, then honest doubt as well as superstitious fear, and blind fanaticism in the garb of philanthropy, and every other form of oppostion, found new food on which to subsist and lengthen out a baneful existence.

A full consideration of the results of such opposition, and the doubt and uncertainty engendered in the popular mind as its legitimate offspring, cannot be entered into in the proper limits of this paper; but, for the purpose of showing to the uninformed and unprejudiced mind, let us enquire what have been the actual facts concerning the sanitary effects of vaccination with all its alleged short-comings, whether real or imaginary, by a comparison of the frequency of small-pox, and its death rate, amongst the unvaccinated and the vaccinated, as shown by records of unquestioned accuracy. For this purpose it is much to be regretted that in this country, statistics bearing upon this, as upon many other sanitary subjects, are so meager, though notwithstanding this, there is every reason to believe from common observation and from the general experience of physicians and sanitarians, that what is absolutely shown by authentic records made and kept for generations in many parts of Europe, is equally true in America, and elsewhere the world over, wherever the practice of vaccination has prevailed. In this comparison, let us bear in mind that previous to vaccination, what has already been shown, that, in the grand average, from one-seventh to one-half of all persons having small-pox died, the mean being about 35 per cent. and that of all the deaths among mankind from one-fourteenth to one-tenth were caused by this disease alone. Let it also be borne in mind that the experience of ages has demonstrated the fact that the human race, unprotected by vaccination, would, in the course of life, with very small exception, contract small-pox, if brought in contact with it, for in no other disease is the contagious element so pronounced and general. It is to be further borne in mind that in no country has the entire population been vaccinated—in many, as in most of the States of our Union, are found large numbers unvaccinated—and that the methods and quality of vaccination have often been defective.

Of the almost unlimited evidence bearing upon the subject, a small portion will strikingly illustrate our point. In England, in 1853, the Committee on Small-Pox and Vaccination of the Epidemiological Society made an elaborate report to Parliament by which it was shown that in England, for every 1000 deaths from 1750 to 1800, 96 were from small-pox, while for every 1000 from 1800 to 1850, only 35 were from that cause; that in Germany, where vaccination had then been more general and thorough, the death rate from small-pox, previous to the use of vaccination, having been 66.5 to every 1,000 deaths, had fallen to 7.26.

In Sweden, before vaccination, the annual number of deaths from small-pox was 1,973 in every million inhabitants. After its introduction, but while optional, it fell to 479 per million, when made compulsory it fell to 180 per million.

In a severe epidemic in Marseilles, France, in 1828, more than ten thousand persons had small-pox. Of these, 2,000 had been vaccinated, 45 of whom died, while of the 8,000 unvaccinated, 1,500, or more than one in five, died.

Dr. Buchanan, of the British Board of Health, has furnished statistics that show on a broad average that in every million people unvaccinated, 3,350 die, while for every million vaccinated, but 90 die, in other words that the death rate is about thirty-seven times as great in the unvaccinated as in the vaccinated.

The following table is copied from American Public Health Association Report for 1884, Page 279, as copied from report of Dr. Wm. H. Richardson of Westport, New York.

"Approximate Average Annual Death Rate by Small-Pox Per Million of Living Population.

COUNTRIES IN WHICH RECORDS HAVE BEEN TAKEN.	Terms of Years in which Particulars are given.	Annual Deaths by Small-Pox per million before Vaccination.	Terms of Years in which Particulars are given	Annual Deaths per million by Small-Pox after Vaccination.
Austria, Lower	1777-1806	2,484	1807-1850	304
Austria, Upper and Salzburg	1777-1806	1,421	1807-1850	501
Styria	1777-1806	1,052	1807-1850	446
Illyria	1777-1806	518	1807-1850	244
Trieste	1777-1806	14,046	1807-1850	182
Tyrol and Voralberge	1777-1803	911	1807-1850	170
Bohemia	1777-1806	2,174	1807-1850	215
Moravia	1777-1806	5,402	1806-1850	255
Silesia (Austria)	1777-1806	5,812	1807-1850	198
Gallicia	1777-1806	1,194	1807-1850	676
Buskwina	1777-1806	3,527	1807-1850	516
Prussia (East Province)	1776-1780	3,321	1810-1850	556
Prussia (West Province)	1776-1780	2,272	1810-1850	356
Posen	- 1780	1,911	1816-1850	743
Bradenburg	1776-1780	2,181	1810-1850	181
Westphalia	1776-1780	2,643	1816-1850	114
Renish Provinces	1776-1780	908	1816-1850	90
Berlin	1781-1805	3,422	1810-1850	876
Saxony (Prussia)	1776-1780	710	1816-1850	170
Pomerania	- 1780	1,774	1810-1850	130
Sweden	1774-1801	2,050	1810-1850	158
Copenhagen	1751-1800	3,128	1801-1850	286
		62,861		7,403

'Thus showing that out of 22,000,000 of people there died annually from small-pox, previous to vaccination, 62,861, and from the same number of people there have died annually, since vaccination was adopted, only 7,403, thus saving annually the lives of 55,458 persons out of 22,000,000, besides the relief from physical suffering which those who are afflicted with this terrible scourge must necessarily endure.' "

The results are still more strikingly shown in foreign armies and navies where every soldier and sailor is required to be thoroughly vaccinated. Thus, from the report of Dr. Balfour, " for the twenty years from 1817 to 1836, inclusive, it is shown that in the dragoon regiments and guards of the British Army, with an aggregate of 44,611 men, and an aggregate mortality of 627, only *three* were from small-pox.

Among the troops at Giberaltar, having an aggregate strength of 44,611 and a total mortality of 1291, only *one* death resulted from small-pox.

In the West Indies several epidemics of small-pox prevailed during the period, but there were *no deaths*, either among the British or white troops, of whom the aggregate strength was 86,661, and with a total mortality of 6,803. Among the black troops on the same station, with an aggregate of 40,934, and a mortality of 1,645, there was not one case of small-pox.

At Bermuda, Nova Scotia, New Brunswick, Cape of Good Hope, and the Mauritius, not a death occurred during these twenty years, and the white troops of Western Africa wholly escaped this disease, while the black unprotected population were dying by hundreds.

In Malta, from 1818 to 1830, inclusive, the aggregate strength of the British troops being 40,826 during these twenty years, and the total mortality 665, only two deaths from small-pox; this is the more remarkable, inasmuch as small-pox raged as an epidemic all over the island in 1830, and again in 1838, destroying 1,169 persons. * * * The native population of Malta in 1830 was estimated 100,839 persons, among whom it appears that one in every 12.1 persons was attacked with the disease, and one in every eighty-five persons died," while "amongst the military, including wives and children, the proportion attacked was one in 188, and the mortality only one in 682." [*Aitkin's Practice.*]

Concerning small-pox in the British army in later years, amongst 473,483 serving between 1859 and 1864, but 664 cases occurred and of these but 40 were fatal, a ratio of less than one to 10,000. "In the British navy, home force, for the same period of time, from 1859 to 1864, inclusive, the following data are furnished: Total mean strength, 127,660. Cases of small-pox, 416; deaths, 29, with a ratio of cases of 33 in 10,000 and a ratio of deaths of 2.3 in 10,000.

In America, "according to a paper read by Dr. Robert Ware, before the Boston Sanitary Association, we learn that in Boston, in 1721, the year in which inoculation was introduced, and when the whole population was 11,000, 5,759, or more than half, had small-pox, and of these 844 died. In 1730 there were 4000 cases and two hundred deaths. In 1752, when the population was 15,684, there were 5,545 cases, and 339 deaths. In 1764 there were 5,646 cases; in 1776, 5,292 cases; in 1792, 8,346. Compare with a subsequent period, after the general introduction of vaccination, and when it was in a measure compulsory. From 1815 to 1830 the mortality was only fourteen; from 1811 to 1839 it was but fifty-two." [*American Public Health Association Report, 1884*].

Dr. Henry A. Martin, of Boston, the highest American authority, (*now deceased*) writing in 1882, (*North American Review, April, 1882*), says, "in 1872-3 an epidemic, the most malignant and destructive in living memory occurred in Boston. Its average mortality among the entirely unvaccinated was considerably over fifty per cent. * * Were it not for vaccination, there would have been in these thirteen months 150,000 cases, and little less than 25,000 deaths, even if the epidemic had been no more contagious than that of 1721," when Boston had 11,000 population, with a mortality of 844.

He further says: "During my entire professional life, I have paid very unusual attention to the study of vaccination, and have had, both in civic and military life, very great and continued opportunity to pursue the study, * * * having in one year made nearly 11,000 vaccinations. * * * As a result of all this exceptional opportunity to form a deliberate and accurate opinion of vaccination, I wish to say, with as much solemn earnestness as if it were my last earthly utterance, that I have never known, among those whom I have vaccinated, a single case of small-pox in any form or modification, except a certain limited number into whose systems the germ of the disease had entered before the time of vaccination, making itself evident within fourteen days after the operation."

Unlimited testimony of like kind could be added, but could volumes more clearly substantiate the fact that vaccination stands preëminently at the head of all discoveries in the world's history for the preservation of human life? Or is further proof needed to show that it has accomplished for humanity what medicine, or legislation, or the edicts of sovereigns, alone or combined, were found powerless to vouchsafe?

HOW CAN VACCINATION BE MADE MOST PROTECTIVE AND SALUTARY TO THE INDIVIDUAL AND THE STATE?

Perhaps, to arrive at the most correct solution of this question, it may be best to still further interrogate the past and consider what lessons may justly be drawn from ninety years' experience; to inquire how far original claims have been verified; what defects in the means or methods employed have been brought to light, and what, if any, advances have been made. Touching some of these points in some manner, considerable has already been said when considering what vaccination has accomplished.

There still remain to be stated here, however, several matters that should be taken into account.

From the records, as shown in the preceding pages, two facts are made apparent, viz: that for fifteen or more years after its discovery, vaccination was not only *believed*—with exceedingly rare exceptions—to be wholly protective against small-pox by Jenner and many others of large observation, but *was actually shown to be so*, up to that time, by statistics covering several millions of cases in England and elsewhere. Whereas, subsequent to the first fifteen or more years, it has been found that no inconsiderable number of persons vaccinated have proved to be but partially protected, or fully protected only for a limited time, varying with different people and under different conditions in respect to age, extent and thoroughness of vaccination, quality of virus used, &c.

Before a dozen years from the date of Jenner's first paper on the subject of his discovery, the question of permanent protection from a single vaccination had been broached. As early as 1809, Mr. Brown of Mussleburg, Scotland, published his belief that its protective power diminished as time from date of vaccination increased, and a few years later, when in 1818–1819 small-pox was epidemic in Scotland, it was found that a considerable number of persons vaccinated had a mild or varioloid form of the disease. The terms 'modified small-pox and varioloid' came into general use about this time, and two classic monographs on the subject made their appearance, one by Dr. Munro in 1818, and another by Dr. John Thompson of Edinburgh, in 1820. Dr. Copland also wrote that he saw and described, as early as 1823, small-pox as it affected members of the same family at different periods after vaccination, and in young persons who had been vaccinated only ten or eleven years. Contrasting such cases, he found that the severity and fully developed condition of small-pox was generally in proportion to the length of time which had elapsed from vaccination. Again, from the bills of mortality of 1825, from the experience of small-pox in France and Italy in 1826, 1827 and 1829—from the experience of epidemics in Ceylon in 1833 and 1834—and from the admissions into the London Small-Pox Hospital in 1838, it has been rendered obvious that the susceptibility to small-pox, which in vaccinated persons is destroyed for several years, returns with advancing age, and becomes greater as life advances. [*Aitkin's Practice, London, 6th Ed. Vol. 1.*]

To this view, objections have been raised by some good authorities who maintain that the lack of complete and lasting protection has been from other causes, and that vaccination when performed with virus fresh from the cow or but few removes from this, its original source, and, with care and skill, will produce the extent of protection originally claimed for it. It is doubtful if this claim can be fully sustained tho' there is the strongest evidence to show that much of the failures to protect are partly due to other causes than the natural gradually lessening protective power conferred by the action on the human system of original cow-pox virus.

The best authorities, however, for half a century, seem quite generally agreed that there can be no certain protection for a lifetime by a single vaccination. Thus, when it is remembered that the methods of vaccinating have everywhere to a greater or less extent been defective, that virus has been used without due regard to its genuineness of quality, and large numbers of people vaccinated in infancy or childhood have passed on through adult years, even to old age, with but the single vaccination of early life, we should not marvel at the facts brought to light by Dr. Marson, whose extended experience through many years in the London Small-Pox Hospital entitles his statements to the highest respect: that whereas, by the records during the first ten years, it is shown that not more than one per cent. of deaths among small-pox cases occurred in persons vaccinated, and that for the period from 1810 to 1835 not more than two per cent: during the period from 1836 to 1852 it had risen to 6.9 per cent: from 1852 to 1867 it advanced to 7.6 per cent. and from 1870 to 1879 to 9.2 per cent.

Thus the experience of ninety years with vaccination may be briefly summed up. Whereas persons unvaccinated if fairly exposed to the contagion of small-pox would almost universally contract the disease, with a mortality of from twelve to forty-five in every one hundred cases, persons of average protection by vaccination, under like exposure, would in only a small minority of cases contract the disease in any form, and when so contracted would generally have it in the modified or varioloid form, but with a mortality gradually increased in the last seventy years from one per cent. in 1815 to nine or ten per cent. at the present time.

This summing up applies only in the broad average, taking people as found the world over. In those countries, states and communities where the greatest attention has been paid the subjects much better results have been reached, a fact that has become especially conspicuous in the armies and navies of the world where the most rigid rules are enforced as has already been shown concerning the armies of England, France and Prussia, in which epidemics of the disease no longer occur.

Having ascertained that small-pox amongst the vaccinated, tho' generally in the form of varioloid, is of more frequent occurrence than formerly, let us inquire, What causes have contributed to lessen or impair the protective effects of vaccination?

One of the principal among such causes is believed to have been stated in the foregoing, viz: that while vaccination once thoroughly performed affords complete and lasting protection in large numbers of persons, it is not in its nature capable of doing so in all, a percentage of people having had vaccination performed but once, however thorough that may have been at the time, are found, who, if exposed to the contagion at a time somewhat remote, will contract small-pox; generally, but not always, in the varioloid form.

Such persons, if subjected to *re*vaccination, will generally be found again susceptible to the action of the *cow-pox* virus, so that the measure of susceptibility to the action of cow-pox virus has, from the early history of vaccination, been regarded as a tolerably correct index to the susceptibility to the contagion of small-pox. Whenever a person by exposure to small-pox would contract the disease, it is probable—nearly certain—that if vaccinated or *re*vaccinated, he would be found to develop the characteristic effects of vaccination; and *vice versa*, whenever a person, by vaccination or *re*vaccination, would develop its peculiar results, it is quite certain such persons would, on exposure, develop small-pox. Hence it may be stated as a corollary, that a person to be protected against small-pox must also be proof against cow-pox by the process of vaccination. Wherever revaccination has been practiced to any great extent, large numbers of persons have been found in whom the second, and occassionally the third vaccination made at intervals of years, has produced as decided effects as the first. It is quite probable that large numbers of cases of small-pox among vaccinated persons have been of this class, and that had revaccination been performed before exposure, no small pox would have resulted.

The assumption, therefore, that a thorough vaccination is as protective as an attack of small-pox against itself, cannot be held to be true in respect to long-time duration, even though it be so for a time, the limits of which cannot be known except by a trial of vaccination.

The following statement of Curschmann may be safely accepted: "Although most persons having had variola vera enjoy for the remainder of their lives a complete immunity from the disease, the protection which vaccinia affords against small-pox is only of limited duration. The exact length of this period of insusceptibility cannot be stated; in the first place, because its own limits are never sharply defined—the disposition always returning, but very gradually. In general, this immunity may be stated at from eight to ten or twelve years. In order to maintain a state of perfect immunity after this period a revaccination is required, and should then be repeated at every expiration of the above-mentioned period throughout the remainder of life. It is only by the careful and universal performance of revaccination that we can insure the most complete effect of vaccination in permanently decreasing epidemics of small-pox. [*Ziemssen's Cyclopedia*, *Vol. 2*, *p. 406.*]

In further evidence of the requirement of revaccination at intervals of time as a necessary means for complete and lasting protection, universal in its application, an almost unlimited amount of proof could be added, and a like almost unlimited amount of proof could be adduced to show that where the practice of revaccination under the most careful supervision has been adopted, the cases of post vaccinal small-pox in any form have been almost completely *nil*, even at times and places where small-pox has prevailed in its most epidemic and virulent form.

Concerning the causes contributing to impair the protection to be afforded by vaccination, something must be said as to *oge*, *methods and extent of the operation* and the *quality of virus* used.

Observation has plainly shown that from the discovery of vaccination, whenever small-pox has prevailed at all extensively, it has been most frequent and fatal in proportion to numbers among children. It is also true in this country, and has been very largely so in the countries of Europe till vaccination among young children has been made compulsory, that the largest per cent of unvaccinated persons in proportion to numbers is found among children. This fact seems to have been abundantly substantiated in the experience of the great epidemic of small-pox that started in France in 1869, during the next two or three years spread over France, England, Scotland, Holland, Prussia, the whole of Northern Germany, Italy and Spain, also to Africa and the West Indies—and which, reaching North America in 1871, spread through large numbers of the principal towns and cities of the country. Almost everywhere in this country the mortality among children was especially noted. The same noticeable fact has recently been further verified, and is fresh in the minds of all from the accounts of small-pox hardly yet extinct in Montreal and other towns of Canada and the Province of Quebe.

For a fuller account of lack of vaccination among children and its results, see valuable report of American Public Health Association for 1884.

In our own, as in many of the States of the Union, where vaccination is only made optional or conditional, up to the age of four years, at which children are admitted to public schools, it is a matter of common observation that a large part remain unvaccinated unless sooner prompted by a small-pox scare by the presence of the disease in a neighboring town or province, up to the time of entering school. Arguments are not needed to show that by just this kind of neglect much of the mortality among young children, powerless and helpless of themselves to avoid the danger, has occurred. As in the past thousands upon thousands of little children, the pride of parental affection and the hope of the public for future good, have perished from careless neglect or unwholesome prejudice, so in the future, while such neglect continues and such prejudice is fostered, will other thousands now in infancy or yet unborn go to swell the list of deaths from preventable diseases.

The methods and extent of vaccination as practiced in the past furnish lessons of no little value to the present generation.

Jenner taught that the care to be observed in the operation was of great importance, that virus should be selected with the greatest scrutiny, that it should be inserted in the skin in parts least liable to be disturbed in its action by friction or accidental injury, that its action should be watched and that if its action or results seemed at all imperfect or unsatisfactory, the operation should be repeated so long as any hope of more perfect results could be entertained. His immediate followers of greatest intelligence and experience held the same views; so also have later celebrated authorities, as Budcock, and Balfour, and Culey, and Farr, and Mason, and Simon, and Seaton, and a host of others in England and throughout Europe, and in America where Drs. Elisha Harris, and Martin, and Foster, and many others, have given great emphasis to the matter of care in the methods and thoroughness of operation. Many have held that every case should be tested by trial of a second vaccination within a short time. While this practice may be efficient in determining whether the susceptibility to the action of the virus has been exhausted, it seems scarcely so in determining whether a vaccination has pursued its characteristic protecting course, since careful inspection by a competent person will generally settle this point. Still, wherever doubt exists, repeated trials should be made. In the early part of the century the possible lack of securing protection was claimed by Mr. Bryce of Edinbugh, and he instituted a test known as "Bryce's Test," by which to determine whether infection in a given case had or had not taken place, which "consists in repeating the inoculation at a certain point in the evolution of the disease, the theory being that systemic infection does not take place at once, but only after the lapse of a number of days from the time of the inoculation. Up to that time a repetition of the inoculation is possible, and, if systemic effect results from the first one, both lesions will mature at the same time, the second one following an accelerated course, reaching its acme rapidly, although dwarfed in size. If, on the other hand, the first inoculation failed to infect the constitution, the second one will pursue its course in the usual manner. Moreover, at a certain time, generally about the fifth day, a repetition of the inoculation will fail altogether if the original insertion has really infected the system" [*Dr. F. P. Foster, in System of Practice, Pepper, Vol. 1, p. 461*]. Of its practibility we are not able to judge. Dr. Foster states that he "can testify that Mr. Bryce's statements are correct."

Concerning the extent of vaccination, or the number of points of insertion of virus with the corresponding number of vesicles necessary to the most complete protection, authorities have not always been agreed. The best authorities in later years, however, seem quite well united in the opinion that a more complete protection is afforded where two or more vesicles are produced, generally claiming that three or four furnish more security than a less number.

In proof of the greater efficiency where several vesicles have been produced, Mr. Marson, of the London Small-Pox Hospital, furnished some years ago valuable and striking information through the medical officer of the Local Government Board, Mr. Simon, as the result of his observations made during twenty-five years, in nearly 6000 cases of small-pox, after vaccination, of which the following, copied from the paper of Earnest Heart ("*The Truth about Vaccination*"), is a summary:

"Cases of Small-Pox classified according to the Vaccination marks borne by each Patient respectively.	Number of deaths in each class respectively.
1. Stated to have been vaccinated, but having no cicatrix............	21¾
2. Having one vaccine cicatrix*........................... ...	7½
3. Having two vaccine cicatrices†..............................	4⅛
4. Having three vaccine cicatrices	1¾
5. Having four or more vaccine cicatrices	¾
Unvaccinated...	35½

*Among the cases in which the one cicatrix was well marked the death rate was 4¼. Among cases in which it was badly marked it was 12.

†Among the cases in which the two cicatrices were well marked the death rate was 2¾ Among cases in which they were badly marked it was 7½."

From the same source, it is ascertained in further proof of the same, and also as bearing upon the results of the different qualities of vaccination as shown by the appearance of the vaccine scars, that a few years later, "In 1871, Mr. Marson gave before the select committee of the House of Commons the results of thirty-two years' observation (1836–67) by him at the London Small-Pox Hospital, as to the quality of vaccination in the fatal cases of small-pox. Summarily, the thirty-two years' observation showed that of 13,765 reputedly vaccinated patients admitted to the hospital during that period, the vaccination was very defective in 11,172, of whom 1,027 died; was reasonably good (as represented by these characteristic marks) in 1,079, of whom twenty-one died; and was quite up to the now acknowledged standard in 1,505, of whom only thirteen died. These facts, while they are conclusive as to the necessity of vaccination, if it is to be a complete, or nearly complete, protection against fatal small-pox, being performed in the most thorough and careful way, illustrates also the extent to which imperfect and insufficient vaccination was practiced at the period when the present adult population would have received their vaccination."

In view of the very great importance of this subject, especially so since the lesson taught by these observations is somewhat new, it may not be unprofitable to follow somewhat further this line of investigation, so ably and extensively pursued by Mr. Marson. We are not aware that statistics covering the points made conspicuous by Mr. Marson have anywhere been collected in this country, nor are we aware of their existence elsewhere, outside of England, tho' such may be the case in parts of Europe where vaccination has received most study and attention.

In England the practice of vaccinating in two or more places on the same person at the same time would seem to be more common than in this country, where, although our best authorities have generally of late years advised two or three, large numbers of physicians have been content to produce one characteristic vesicle, and most people think that so long as they can show one cicatrix with the characteristic pit marks they can gain little additional protection by further vaccination.

The saying so often heard among physicians that "one place (of vaccination) if it takes, is just as good as half a dozen," seems very far from being obsolete among the older men of the medical profession of this country. It would also seem to need to be revised and amended should Mr. Marson's experience continue to be confirmed in the future as the following tables show it to have been on a large scale in the recent past.

These tables are also copied from Earnest Hart's Paper (*The Truth about Vaccination*, *London*, *1880*) and constitute a part of a masterly and exhaustive report made to British Parliament, session of 1880.

Although statements are lacking showing what proportion of the vaccine cicatrices were caused by first vaccinations and what by revaccinations and the length of time elapsed since vaccinated, the statistics coming as they do from different sources, under different observers, on so large a scale, and following Mr. Marson's, based on nearly 6000 cases, all tending to the same general conclusions, constitute an argument that challenges attention everywhere.

VACCINATION MARKS OF PATIENTS AT HOMESTON SMALL-POX HOSPITAL, 1871–1878.

		Admissions.	Deaths.	Death Rate per 1000.	
CLASS I. Vaccination of Good Quality.					
Sub-Class 1.	Four Marks..........	263	4	15	General Death Rate of Class I, 33 per 1000.
" 2.	Three "	396	12	30	
" 3.	Two "	532	17	32	
" 4.	One "	435	21	39	
CLASS II. Vaccination of Indifferent Quality.					
Sub-Class 5.	Four Marks or more ..	344	19	55	General Death Rate of Class II, 111 per 1000.
" 6.	Three "	540	42	77	
" 7.	Two "	952	104	109	
" 8.	One "	821	130	158	
CLASS III. Stated to Have Been Vaccinated, but with No Evidence of Vaccination.					
Sub-Class 9		793	216	272	Death Rate of Class III, 272 per 1000.
CLASS IV. Unvaccinated.					
Sub-Class 10..........................		1477	676	4	Death Rate of Class IV, 452 per 1000.

VACCINATION MARKS OF PATIENTS AT HAMPSTEAD SMALL-POX HOSPITAL, 1876–1878.

		Admissions.	Deaths.	Death Rate per 1000.	
CLASS I. Vaccination of Good Quality.					
Sub-Class 1.	Four Marks or more ..	222	7	31	General Death Rate of Class I, 57 per 1000.
" 2.	Three "	254	15	59	
" 3.	Two "	266	12	45	
" 4.	One "	198	19	95	
CLASS II. Vaccination of Indifferent Quality.					
Sub-Class 5.	Four Marks or more...	241	13	58	General Death Rate of Class II, 113 per 1000.
" 6.	Three "	334	29	86	
" 7.	Two "	511	68	133	
" 8.	One "	426	61	143	
CLASS III. Stated to Have Been Vaccinated, but with No Evidence of Vaccination.					
Sub-Class 9..........................		53	17	320	Death Rate of Class III, 320 per 1000.
CLASS IV. Unvaccinated.					
Sub-Class 10..........................		847	397	468	Death Rate of Class IV, 468 per 1000.

QUESTION OF VIRUS, HUMANIZED OR BOVINE?

Jenner commenced vaccination with cow-pox virus, and believing in common with his immediate followers that the disease, in whatever animals occurring, primarily had a common origin, the practice was continued not of vaccinating with virus direct from the cow, but from the arms of persons after successive transmissions from one person to another. This has been the practice, with comparatively few exceptions, in England to the present time, and in America and other countries till within a comparatively few years. In confirmation of this statement the following is quoted from Curschman's article on vaccination, in *American Edition of Ziemssen's Cyclopedia of Practice, 1875:* "Although, in accordance with the method of Jenner, vaccination was originally performed with cow lymph, vaccinia is now almost universally transmitted from one person to another through many generations, only the first individual in the series receiving the virus direct from the cow. The vexed question as to the superiority of this humanized lymph over the actual contents of the cow-pock has not yet been settled. To attempt to decide the question at present would be unjust to both sides. Two objections are urged against the use of cow lymph. First, it is claimed that vaccinations with it fail more frequently than with humanized lymph, and secondly that the local symptoms are much more violent than when the latter is used.

The objection has been made to humanized lymph, on the other hand, that its protective power becomes gradually weakened after it has passed through several generations. We must reject all such assertions as are based upon general impressions and are not supported by extended statistical investigations. The investigations thus far made lack both exactness and scope, for, unfortunately, in no country at present are vaccination and revaccination so carefully managed or under such perfect control as would be desirable. As the question now stands, there is no sufficient reason why we should give up the use of humanized lymph for true vaccine matter direct from the cow, and the former is much more easily obtained." This seems a fair expression of the views generally held in Europe a dozen years ago, and which are largely held at the present time, tho' in France, Germany and elsewhere, attention has recently been attracted to the use of cow-pox lymph through the claims made for its superiority in America, largely through the enterprising and painstaking labors of the late Dr. Henry A. Martin of Boston.

An inquiry concerning the efforts that have been made at various times to propagate a new stock of vaccine lymph by inoculating small-pox virus into animals, by the process of so-called retro-vaccination, or the vaccination of cows with humanized vaccine lymph, &c., would furnish an interesting topic for discussion in this place, but the proper limits of this paper will not permit such inquiry. It must suffice to say that such efforts have failed of accomplishing the purposes for which they have been made—that is an improvement upon the use of the long-humanized virus.

The opportunities and facilities for obtaining cow-pox virus anew, as did Jenner, from the cow, and so renewing the stock, have not often happened, for during the last one hundred years spontaneous cow-pox among cattle, of unquestioned genuineness, has but rarely occurred. Such an occurrence, however, took place in France, in 1866. At that time a case of genuine spontaneous cow-pox in a milch cow was discovered at Beaugency, France. From this cow others were inoculated. The nature of the disease being thus made certain, the stock continued to be propagated down to the occurrence of the Franco-Prussian War, when, in the excitement of strife, the "stock" in France is said to have been lost. "But most fortunately for America, and perhaps even for the world, through the philanthropic enterprise and energy of that celebrated vaccinator, Dr. Henry A. Martin of Boston, some of this virus was brought by special messenger to him, in September, 1870. The virus he received was from the 258th, 259th and 260th of the series from the Beaugency cow. Dr. Martin and his son, who some years ago succeeded him in business, have perpetuated it uninterruptedly to the present time. All the other producers of bovine virus in this country have their stock from Dr. Martin Senior or Junior." [*Prof. C. A. Lindsley, in 4th Annual Report of Connecticut State Board of Health, p. 109.*]

At first many were slow in adopting the use of this new "stock" of virus from one reason or another, principally from an apprehension of a harshness of its action and an uncertainty in getting it to take effect. But whenever used its results were found to be so satisfactory that in a few years it began to be in demand throughout the country, so that in America at the present time but little vaccinating is done by the use of any other virus than that direct from the cow, or at farthest but few removes therefrom. Indeed, so far as we are made aware, physicians in all the States are using the bovine virus. As already stated, its use has for several years attracted attention in foreign countries. The objections made to it have been that it afforded less protection against small-pox than humanized virus, a view that is no longer maintained; that it is less likely to take effect, and when it does is slower in developing; and that it is more harsh in its action than humanized virus.

On the other hand the claims made in its favor are that it has more protective power against small-pox, that it can easily be obtained on short notice at any time and in any quantity, that it is as mild and uniform in its action and that it is absolutely free from any danger of contamination by syphilis. The question of comparative protective power of bovine and humanized virus cannot be regarded as even now settled. No comparative statistics having yet been gathered on a scale of sufficient magnitude to decide, tho' there is in America and elsewhere a strong conviction in favor of bovine virus in this regard.

Dr. Meares, health officer of San Francisco, in his annual report four years ago wrote, "The bovine virus (Beaugency stock) has been exclusively used by the health department since its introduction five years ago. The vaccinations since that time have reached the large number of over 80,000. * * * I have yet to see a case of variola or varioloid after a successful vaccination with bovine virus."

Other things being equal, the facilities for obtaining bovine virus and its absolute freedom from danger of communicating syphilis are sufficient to command its use.

The best American authorities hold that while in revaccinations it does sometimes show greater energy, as manifested by a greater amount of inflammation about the parts vaccinated, and a greater amount of constitutional disturbance for the time, in first vaccinations this evidence of greater energy of action is lacking, and that in either case it is every way as safe as humanized lymph.

Certainly, in this country, so far as general observation can determine, the results of vaccination with the bovine virus during the last few years have been quite as satisfactory as with humanized virus in preceding years.

That very much more poor vaccinating was done formerly with humanized lymph than latterly with bovine, there can scarcely be a doubt. What was said in England some years ago by Mr. Marson, that "all persons, amateurs, druggists, old women, mid-wives, etc., are allowed to vaccinate in any way they may think proper, and the persons operated on are considered to have been vaccinated," has been equally true here. The late Dr. Elisha Harris, one of our foremost authorities, not long since said, "what is called vaccination is, in a vast number of persons in the United States, only so in name and not in reality." By the former method great lack of care and uniformity in selecting virus at the proper stage of development of the vesicle was almost inevitable, and not only in respect to stage of development, but in quality of virus as well. The use of lymph obtained from revaccinated persons, having but imperfect sores, is believed not infrequently to have been used; also lymph containing blood, matter and other impurities. By the use of bovine virus obtained from reliable sources, the quality of lymph must be more uniform and free from deleterious elements.

Vaccination, from its earliest days, has encountered opposition in almost every conceivable form, but almost always from a class of people more noted for their rash prejudice or self-agrandizing enthusiasm than for their regard for the evidences of truth brought to light by scientific investigation and unprejudiced observation.

Most of the objections have been disproved again and again by evidence so strong as to leave no ground on which to build a shadow of argument; so that the only remaining one at all worthy of consideration is, that other diseases than vaccinia may be communicated by vaccination, and even here it has been abundantly shown that the only diseases from which any danger to health can arise are erysipelas and syphilis. The occurrence of either of these, even when humanized lymph has been used, have been of so exceeding rare occurrence, as, when compared to the immense saving of life by vaccination, to be of any weight, other than to prompt the utmost care in the selection of virus. When bovine virus is used even this objection falls utterly to the ground.

The importance of vaccination to the community at large has been recognized by all enlightened governments, state and national, throughout the world; and in many, laws, more or less compulsory in their requirements of its practice have been enacted. Thus, in France, while there is no general law, departmental regulations are issued by prefects. A certificate of vaccination is required of candidates for the government schools and in some private schools.

In Scotland, all children are compelled to be vaccinated at six months old. The same is true in Ireland. England requires vaccination before the age of three months. In Germany, the age is fixed at one year, and in Sweden, at two years. In Sweden and Belgium, vaccination is enforced by indirect means. This is by encouragement, persuasion and abridgement of privileges.

In this country nearly all the States have passed laws making vaccination compulsory, or conferred upon State and municipal boards of health, either by a general law, or by the special acts by which such boards are created, the power to compel vaccination. Compulsory measures, however, are rarely enforced in other than exceptional instances. When children are only required to be vaccinated at the time of entering public schools, many fail of protection during an important period of life.

There can be no doubt that greater attention should be given to the matter of vaccinating in infancy as well as to revaccination in more advanced life.

In this State the law only makes vaccination optional and conditional. Children may be debarred from entering schools till vaccinated. A person from a place infected with small-pox may be restrained till vaccinated. Our law provides "That the mayor and aldermen of any city, and the selectmen of any town or plantation, *shall annually*, on the first day of March, or oftener if they deem it necessary, provide for the free vaccination with the cow-pox, of all the inhabitants over two years of age within their respective localities, to be done under the care of skilled practising physicians, and under such circumstances and restrictions as said authorities adopt therefor." This provision has rarely if ever been enforced to any notable extent till the threatened invasion of small-pox from neighboring provinces in the autumn of last year; since which reports of compliance with this provision for free vaccination have been received at the office of the State Board of Health from one hundred and seven towns.

Much may be said in favor of laws making vaccination compulsory, but up to this time other means to accomplish the same end have not been exausted. The people of this and other communities need to be further enlightened and encouraged. Laws making it optional and conditional should, however, be more generally enforced. No unvaccinated child should be allowed to attend public school, and no unvaccinated person should be received into educational institutions, penal institutions or factories, and free vaccination should be made available to every person unable or unwilling to pay the expense.

From a candid survey of the whole subject we are led to the following

CONCLUSIONS:

1. That small-pox, uncontrolled and unmitigated by vaccination and other sanitary restraints, would now, as in the past, be more destructive of life and health than any other disease.

2. That isolation and quarantine, and all known sanitary measures, vaccination excepted, are incapable of protecting a community against its fearful ravages.

3. That vaccination is a stronger safeguard than any and all other known means, and that when universally practised after the best known methods will prove well-nigh universally protective.

4. That to insure the greater measure of protection, all unprotected persons should be vaccinated, all children hereafter born should be vaccinated in infancy, and that revaccination should in all cases be practiced at intervals of seven or eight years till after full adult life, and at other times of unusual danger from small-pox.

5. That the danger of communicating other diseases than cow-pox, when vaccination is performed by a competent person, is so small as to admit of no comparison with the benefits to be derived from the operation.

6. That the only diseases known to have been communicated are erysipelas and syphilis, and these only in very rare instances, and that with the use of bovine virus there is no possibility of transmitting either of these.

7. That the extent of protection is to some extent measured by the number of characteristic vaccine vesicles produced.

8. That the greatest care is necessary in selecting pure and reliable virus, and that the operation of vaccination should be performed only by persons skilled, and qualified to judge concerning its results.

9. That wholesome laws regulating the practice and in some measure compulsory, but not repulsive and oppressive to a fair sense of justice, are necessary.

10. That as preliminary and necessary to the greatest protection and best results to the State from vaccination, greater efficiency in the methods of securing vital statistics is needed.

TECHNICS OF VACCINATION.

This part of our subject can be but briefly dwelt upon; partly because of lack of space, and partly because in the foregoing discussion of its general and scientific aspects, many points relating to it as an art have already been considered.

Until comparatively recently the humanized virus or lymph has been wholly used in this country from the stock originating with Jenner, having been transmitted from person to person through many years. Vaccination was sometimes performed from arm to arm with the fresh lymph secured by pricking the vesicle on the person furnishing the lymph and conveying it to some abraded or punctured place or places on the skin, usually of the arm of the person to be vaccinated. More frequently, however, the virus used was the dried crust or scab obtained from the vesicle of a person, generally a healthy child, who had recently been vaccinated. This was the virus in general use. When used it has been the general custom to soften a portion of this by rubbing up with a little water or glycerine and apply in the manner described. When but little vaccinating was being done, great difficulty was sometimes experienced in obtaining virus. On the importation of cow-pox virus into this country by Dr. Martin, in 1870, he immediately commenced producing this kind by inoculating it into heifers, by which the disease, when thus produced, furnished a considerable number of cow-pox vesicles about the udders of the animals from which large quantities of this lymph or virus are collected, by carefully opening the vesicles and collecting their contents on thin ivory points or quills, where it is allowed to dry. When dried, these are carefully packed in air-tight cases and hermetically sealed for use. The process of obtaining this virus is intrusted only to experienced persons, who exercise the utmost care in taking the lymph at the best stage in the development of the vesicles, and in excluding from it all blood, matter or other impurities. Many others, in various parts of the country, by using this stock of virus, have engaged in the business of production and supplying the demand for it.

Dr. Martin thought that much care was demanded in its production, and, by great diligence and unswerving integrity, established a reputation as one of the foremost of the world's promoters of protection against small-pox by vaccination. Of the relative merits of the productions of the various parties supplying this cow-pox, or bovine virus, we are not able to speak.

For several years this cow-pox, or bovine virus, has almost wholly taken the place of the humanized, as formerly used. Other methods of furnishing than upon ivory or quill points have been considerably in use, as in fine sealed tubes, etc., the object being to furnish a pure lymph in a convenient form and in condition to retain its virtue and purity for the necessary length of time.

The humanized lymph of few removes from the heifer is still used to some extent, and may be obtained in the same form as the bovine —on points, quills, etc. As already stated, this new stock of virus has almost if not entirely taken the place of the long-humanized Jennerian stock. For all ordinary cases the preference of the best American vaccinators is given for bovine virus, and is considered decidedly best for the principal reasons that it is absolutely free from danger of communicating erysipelas, syphilis, or other diseases that have sometimes been charged to the use of humanized lymph. It is one or two days slower in developing the characteristic vesicle than the humanized lymph, so that in case of persons known to have recently been exposed to small-pox, there may be an advantage in using the humanized lymph in preference to the greater certainty of anticipating the severe form of small-pox.

Whenever humanized virus is used the utmost care should be exercised in obtaining it from a person known to be free from any infecting disease. A healthy child is to be preferred and the virus taken on the seventh or eighth day from date of vaccination. It should contain no blood or pus, and should always be taken from a first vaccination and not from revaccination vesicles.

Vaccinations are usually made in the left arm, as being more free from liability to injury from accidental causes, tho' any other part of the body, from any cause more convenient, may be selected. Various methods of inserting the virus have been practised, as by puncture with a pointed instrument, superficial cutting and scratching of the skin (scarifying), scarping, &c. The methods generally considered best are by scraping the outer portion of the skin away till the appearance of blood can barely be noticed, then applying the lymph— if in the liquid form, by brushing it upon the surface; if in the dried form, on points by first moistening the points with a little water or glycerine, then rubbing them upon the surface thoroughly till the virus is all removed; or, what is considered preferable by some.

Scraping away the outer portion of skin, then, by a few rapid movements of the point of the lance, making three or four horizontal and perpendicular incisions about a third of an inch in length, but only of sufficient depth to cause the slightest appearance of blood. The parts need ordinarily no other protection than the dress usually worn ; but all scratching and fretting and all breaking of the vesicles are to be avoided, since these may obscure the quality of the resulting vesicle and lead to ulcerations of deeper parts, which may be slow in healing. The part of the arm usually selected is that upon the outer surface about two-thirds the distance from the elbow to the shoulder.

According to the observation of best recent authorities, vaccination should be performed in three or four places to afford greatest protection, and at sufficient distances from each other that when the vesicles are fully formed they will not meet, generally an inch or a little more. Whatever instrument is used to vaccinate with, it should be thoroughly and scrupulously cleansed after each operation.

If the vaccination is successful, a little papule, or pimple, appears on the third day, which, gradually increasing in size, on the sixth day becomes a little watery in apperance (vesicular), and is a little depressed in the center, the edges being a little raised and sharply defined. On the eighth day it is usually fully formed, the central depression being marked and slightly different in color. At this stage the vesicle is fully distended with lymph, and surrounded by a reddish border (areola) which, gradually widening, by the tenth day becomes about two inches in width, sometimes more. At this time there is usually a sense of heat and itching in the parts, and not unfrequently the little glands under the arm swell. The person is apt to feel a little feverish for one or two days, the feverishness at times being considerable. Not unfrequently the swelling of the arm and about the point of vaccination is considerable. The swelling begins to subside on the tenth or eleventh day, and the contents of the vesicles become turbid and yellowish, deepening into a brown color by the fourteenth day, then drying into a hard mahogony-colored or brown scab which is not usually detached before the twenty-third to the twenty-fifth day, and sometimes later. A deep, well-defined circular scar results, having a peculiar pitted or foveated appearance, which generally continues through life.

An eruption in the form of a rash, or in the pimply (papular) form, sometimes occurs about the time of full development of the vaccination. Sometimes one or more vesicles, usually smaller in size, form around that where the lymph was inserted.

The age and conditions under which children should be vaccinated is a subject of frequent inquiry.

There is no weighty objection to vaccinating a child very soon after birth, if it is vigorous; but if there is no special danger of exposure to small-pox, it may be well to defer it till about three months old, a time more favorable than a few months later, when teething has commenced. With children sickly from any cause it is usually prudent to wait for a favorable condition, but generally children should be vaccinated as early as three months of age.

Children with a tendency to eczema (salt-rheum) are not infrequently found to have an outbreak of the disease following vaccination. This may or may not be a result of the vaccination. Besides eczema there are a few other forms of cutaneous diseases, sometimes difficult to classify, that are known to follow. They are of the imitation form, and depend on peculiarities of system rather than any infecting quality of the virus, and are serious only as the underlying causes in the system may render them so.

Vaccinia occasionally pursues a somewhat irregular course. Instead of the characteristic vesicle and the firm brown crust with the thickened and well-defined outer border, a thin, irregular, straw-colored crust forms, leaving an irregular, ill-defined scar. Such results have been found protective. Besides this it occasionally happens that a red elevation of skin at the point of vaccination takes place without the formation of any vesicle. It is usually slow in its course, and does not go on to full development. It generally lasts for several weeks as a hard, flat excrescence, then gradually disappears and is not considered protective.

In conclusion it must be said that vaccination should be regarded as a sanitary measure of the utmost importance, demanding skill in its performance and watchful care for thoroughly protective results.

LOCAL BOARDS OF HEALTH.*

By J. O. WEBSTER, M. D., Member of the Board.

The establishment of an independent local Board of Health, in every town of considerable size, seems to me a matter of great importance; and knowing that physicians are everywhere foremost in sanitary work, and have rightly come to be looked to as the advisers of the community in all matters relating to the public health, it has seemed well to present the above subject to this Association, in hope of enlisting its members in missionary work in that direction.

THE PRESENT SYSTEM.

In most of the towns and cities of this State there is only an *ex-officio* health committee, consisting usually of the selectmen of a town, of the mayor, city marshal and city physician of a city. In some cities there is no committee, but the city marshal is health officer. In case of neglect to provide a health committee or officer, the selectmen of a town, or mayor and alderman of a city, are a health committee under the law. [Ch. 14, § 15.]

OBJECTIONS TO PRESENT SYSTEM.

1. *Inefficiency.* Experience in this, as well as in all other States, has shown the inefficiency of *ex-officio* health committees, health officers or boards of health. The selectmen of a town, or mayor and alderman of a city, are selected for some other reasons than their familiarity with sanitary science or their fitness to become the health advisers of a community, and they usually have

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* From Transactions of the Maine Medical Association.

sufficient employment in fulfilling the duties of their respective offices. A city marshal is not usually especially qualified for the duties of a health officer, and his time, as well as that of the city physician, is otherwise occupied.

2. *Limited Powers.* Besides the *ex-officio* character of these officers, a health committee or health officer has very limited powers under the statutes. [Ch. 14, § § 14 and 16.] Their functions are limited to removing filth, sources of filth or other causes of sickness, or compelling owners or occupants of premises to do so. The control of contagious or infectious diseases, removal of infected persons or goods, removal of infected prisoners, quarantine, hospitals for infectious diseases, vaccination, and contagious diseases among domestic animals, except when commissioners are appointed by the Governor, are intrusted to municipal officers.

POWERS OF A BOARD OF HEALTH.

But, should a local Board of Health be chosen, its members shall, in the language of the statute, "have all the powers and be subject to all the duties, restrictions, liabilities and penalties of the municipal officers, and of the health committee or officer." [Ch. 13, § 34.]

It is seen that a Board of Health has very extensive powers, that it is entirely independent of the municipal officers, and has exclusive charge of the enforcement of the health laws of the State, as well as of the by-laws adopted by the local municipality.

It follows that the members of a Board of Health should be selected with great care, with due regard to the great responsibility of their office, on the sole ground of fitness for the special duties entrusted to them, without reference to the considerations that generally rule in the choice of municipal officers; and it is obvious that a Board composed of other city officials, acting *ex-officio*, would not be likely to fulfil these requirements.

It is to be regretted that our largest city, in forming a Board of Health under a special act of the Legislature, did not avail itself of the opportunity to establish an independent Board, which would, judging from all past experience, have doubtless proved of much greater advantage to the public welfare than the present complicated Board.

BOARD OF HEALTH—HOW CHOSEN, ETC.

A Board of Health can be chosen by the voters of a town, in town meeting, or by the City Council of a city. It shall consist "of not less than three nor more than nine persons." Three members may suffice for towns, while five would be a suitable number for the smaller and seven for the larger cities. It is desirable that each Board should contain one or more physicians.

In every town, I donbt not, there will be found well qualified and independent men, who are self-sacrificing enough to undertake and perform the duties of a local Board of Health.

HEALTH REGULATIONS.

In this State, the law does not give a Board of Health authority to establish local health regulations, but it does give almost unlimited power, in this respect, to towns, cities and village corporations. [Ch. 3, § 59, and Ch. 14, § 36.] These regulations should be prepared by the Board of Health, but must be adopted as ordinances, in town meeting or by a City Council, to give them a legal status. Models for health regulations will soon be furnished by the State Board of Health; and towns or cities that have adopted such rules will doubtless be glad to furnish copies of their own.

AUGUSTA BOARD OF HEALTH.

An efficient Board of Health has been established in Augusta, of five members, the first five being appointed two for one, two for two, and one for three years, future appointments to be for three years.

The Board is to report to the City Council annually.

They can hold such meetings as they deem necessary, and adopt by-laws for their own government.

They shall choose annually from their number a President and Secretary.

The Secretary is the executive officer of the Board, and receives pay for his services; the other members receive no compensation.

The Board has prepared a set of rules, which has been given the force of law by being adopted as an ordinance by the City Council.

The moral effect of the appointment of the Board was seen at once. People did not wait to be visited by the Board, but immediately began to clean up, removing, in some instances, accumulations of years, if not of generations. Still, the Board found ample material left upon which to exercise their functions, and have no present fear of their office becoming a sinecure. The members of the Board were themselves astonished at the number of nuisances dangerous to health found. But the city had previously had a health committee, as efficient as such committees usually are, and its condition was no worse than that of other cities without an independent Board of Health.

I do not present the manner in which the Augusta Board is constituted as a model to be followed in other places, but as suggestive, to some extent, of the general principles to be followed in organizing local Boards.

CONCLUSIONS.

In conclusion, I present the following propositions:

1st. A local Board of Health should be established in every city and in every town of considerable size.

2d. It should be an independent Board, not containing any other municipal officers, *ex-officio;* all its members elected with sole reference to their fitness for this work.

3d. The members of the Board, or its executive officer, if they have one, should receive reasonable compensation.

4th. Such local health regulations as the Board may find necessary, in addition to their powers under the State law, should be adopted as by-laws or ordinances by the town or city.

GLOSSARY.

This Report has been prepared for the benefit of all classes of persons in the State, and as far as possible it has been the wish to make its language as clear and intelligible as possible. A few technical terms, however, are so inseperably interwoven into the consideration of the subject of public hygiene that the avoidance of their use is impossible, and as it is desirable that the general public should become acquainted with their meaning, and especially to know in what sense they are used in the present work, this Glossary is introduced.

Ætiology. [See Etiology.]

Bacilli. The plural of Bacillus.

Bacillus. One group of bacteria which are filiform, or consist of slender rods.

Bacteria. Organisms, microscopic in size, on the border land between the vegetable and the animal kingdom, but now regarded as pertaining to the former.

Bacterium. The singular of bacteria.

Biology. The science of life.

Bovine Virus. Vaccine virus taken directly from the calf or heifer.

Contagion. The specific cause of certain diseases by means of which they may be transmitted. Also applied to the act of transmission of communicable diseases.

Contagious. Capable of being transmitted by contagion; communicable, infectious.

But little effort has been made in this Report to discriminate between the meaning of Contagious and Infectious; although their derivation and original application were different, most of the later medical writers of Europe and America use the two words interchangeably. This, at least in works for popular use, is the less confusing way.

Deodorants. Substances which destroy offensive smells. Some, but not all deodorants, are also disinfectants. [See Disinfectants.]

Desquamation. The shedding of the outer skin, usually in scales, after scarlatina and some other diseases.

Diagnosis. The determination of the character of a disease.

Disease Germs. Bacteria; micro-organisms whose reception into the system and multiplication in it, produce the contagious diseases.

Disinfectants. Agents or substances by means of which the contagion of diseases may be destroyed. Often improperly applied to substances which, though useful as deodorants, are nearly or quite valueless as germicides.

Endemic. Applied to diseases which prevail in particular localities or districts, and which are due to local conditions or causes.

Epidemic. Common to, or affecting many people at the same time; generally prevailing. The causes of epidemics were formerly very generally regarded as depending upon an "epidemic constitution of the atmosphere," but of this there has never been collected any satisfactory proof. The more we study epidemiology the more we are led to look to contagion and the laws which govern its diffusion for an explanation of the occurrence of epidemics.

Epizoötic. Applied to the diseases of animals in the same sense as epidemic is used with reference to human diseases; affecting many animals at the same time.

Etiology. The causation of diseases.

Exogenous. Produced, or generated outside the system.

Exotic. Foreign; a disease introduced from some other country.

Fomites. Substances or articles which are liable to carry the contagion of diseases.

Germicides. Destroyers of germs; disinfectants.

House-drain. That part of the house-drainage system which carries the wastes from the soil-pipe and waste-pipe to the sewer.

Humanized Virus. Vaccine virus taken from the cow-pox vesicle which has been produced on the human arm; usually the arm of a child.

Hygiene. The science and art relating to the preservation of health.

Infection. Contagion; the specific cause of communicable diseases, now known in some diseases, and supposed in others, to be a microscopic organism.

Infectious. Communicable as a disease; contagious. [See Contagious.]

Microbe. Bacterium.

Pathological. Pertaining to pathology; diseased.

Pathology. The knowledge of diseases.

Phthisis. Consumption.

Physiology. The science which treats of the functions of living animals or plants.

Prognosis. The prediction, from the present symptoms of a disease, of its future course or termination.

Quarantine. The enforced isolation of persons and things coming either by sea or land from places where contagious diseases exist.

Sewage. The liquid and other filth conveyed in sewers.

Sewer. A drain for conveying dirty water and filth.

Sewerage. A system of sewers.

Soil-Pipe. The pipe which conveys excreta from water-closets and urinals.

Sporadic. Applied to diseases, it means occurring in single or scattered cases, as opposed to epidemic or endemic, in which numbers or many are affected.

Tellural. Pertaining to, or proceeding from, the earth.

Trap. An arrangement on some part of the sewerage system, usually a bend in the pipe in which water stands, by means of which we seek to prevent the return of gases and disease germs into the building.

Tuberculosis. A specific disease usually characterized by the formation of tubercles. Pulmonary consumption is the result of tuberculosis of the lungs.

Typhoid Fever. Meaning literally a fever resembling typhus. The common fever of this country. Formerly typhus fever and typhoid were not distinguished, the one from the other. Typhoid fever is communicable only in a slight degree, if at all, by direct contagion; but there is great danger of its spread from the sick to the well from defective sanitary arrangements and regulations. [See page 89.]

Typhus Fever. A dangerously contagious disease rarely found in this country, and when appearing in our State, probably always by importation. [See Typhoid Fever.]

Vaccination. Inoculation with the virus of cow-pox.

Vaccine Virus. The infective material from the cow-pox vesicle used in vaccination.

Variola. Small-pox.

Varioloid. Small-pox modified by vaccination. It is contagious, and as severe cases of small-pox may arise from exposure to its infection as from unmodified small-pox.

Waste-Pipe. That part of the system of house-drainage which conveys the waste-water from sinks, baths, etc.

Zymotic. Characterized by fermentation. Applied to epidemic, endemic, and contagious diseases, on account of the similarity between the process of fermentation and that which is started in the organism after its infection with the cause of any of these diseases.

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ERRATA.

Page 100—For "*Anthens*" read *Athens*.
" 104— " "W. L. Lunt, m. d.," read W. L. Hunt, m. d.
" 134— " "Geo. H. Libby, m. d.," read Geo. A. Libby, m. d.
" 151— " "E. Tuell, m. d.," read James E. Tuell, m. d.
" 169— " "**Cholera**" read **Phthisis**.
" 206— " "I. M. Tarfton, m. d.," read I. M. Trafton, m. d.
" 239— " "W. A. Wilbur, m. d.," read G. A. Wilbur, m. d.

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